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In case you forget, the gas cap is on the right.



**Introducing the all new Chevrolet Equinox.** The crossover that offers an amazing 32 mpg highway and up to 600 highway miles on a single tank of gas.¹ That's better than the Honda CR-V, Toyota RAV4 and even Ford Escape Hybrid.² Equinox was even named A Consumers Digest Best Buy. Everyone deserves a crossover that saves money at the pump. **Starting at \$23,360.³ Find out more at Chevy.com.** 





## On the Wings of Innovation: Lufthansa First with FlyNet™ Broadband

Business travel is buzzing with news of Lufthansa's relaunch of their FlyNet in-flight broadband Internet service. We talked with Lufthansa VP of Product Management and Innovation Christian Koerfgen to get the scoop on their sky-high WiFi:



You're bringing FlyNet back. How is it different from what is already out there? This is an industry first-no other airline offers FlyNet broadband Internet access on intercontinental flights. While this service will now provide

the same high-speed Internet access as before, in 2011, in-flight data transfer and SMS messaging over standard GSM/GPRS mobile networks will also be possible.

Why the extra step of offering GSM/GPRS connectivity instead of the usual WiFi? With the integration of GSM/GPRS, customers will soon be able to use smartphones or mobile phones in addition to laptops.

Does this mean the cabin will be full of people chatting on their cell phones? No, in response to customer feedback, voice telephoning will remain technologically blocked. Of course, on board phones are still available for use in the galleys if needed.

Can anyone on board a Lufthansa flight use the new service easily? FlyNet is impressively user-friendly. Throughout the entire aircraft cabin, the passenger can log on with any WiFi- or GSM/GPRS-enabled device, just as at any public hotspot.

Many business travelers work with sensitive information. How secure are data transfers and email on Fly-Net? The connection provides the same security standards as public hotspots.

What's all the cool technology

navigation system on each aircraft directs the on board antenna electronically to the correct satellites, ensuring uninterrupted in-flight connection. At a flying speed of about 550 miles per hour, the position of the satellites at a height of 22,000, miles and the changing pitch require a very challenging and sophisticated coordination of all components.

What does Lufthansa offer the business traveler that no other airline does? Our business travelers demonstrate a key need to stay connected, and Lufthansa is the first and only airline to offer FlyNet broadband Internet access in the skies. This service completes the standardized communications products for Lufthansa passengers throughout the entire travel chain.





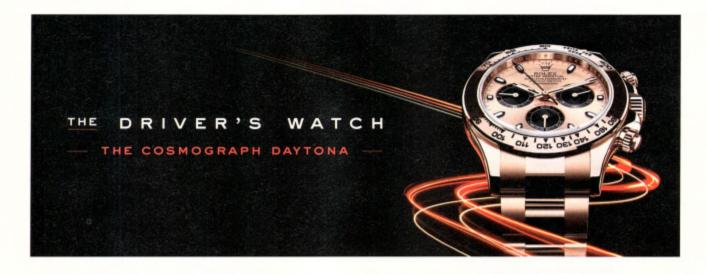
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Rolex was already producing the first sophisticated chronograph stopwatches for professional drivers as early as the 1930s. In 1935, British daredevil Sir Malcolm Campbell set the world land speed record, with a Rolex Oyster on his wrist, and entered the history books as the first human to exceed 300 miles (483 kilometers) per hour in his famous "Bluebird."

Before transcontinental flights were considered the everyday experience they have now become, before satellite broadcasting, and long before the cellular telephone, Rolex was perfecting the world's most accurate stopwatches. In 1963, with the 6239 model, Rolex launched a new line called Cosmograph. The revolutionary design of the Cosmograph allowed the measurement of speed in units of time through a stopwatch function recording elapsed time. It would not be until 1965, however, that the name "Daytona" was added to the dial as a tribute to the great Florida race, the "world center of speed."

In 1971, the Triplock winding crown was also added for further protection. While the Daytona is strictly speaking a chronograph – deriving from the Greek "chronos," time, and "graphis," writing – the essence of the Cosmograph was that the tachometer unit measurements of time, initially 300 and now 400, were engraved on the bezel and not on the dials. These neutral units can be used to determine speed in either kilometers or miles.



A Rolex testimonial: Tom Kristensen. The only racing driver to win the 24 Hours of Le Mans eight times.

Rolex put the full force of its research capabilities behind the development of the Cosmograph Daytona. Inside the elegantly designed casing, the Cosmograph Daytona is a masterpiece of watchmaking with its 4130 chronograph caliber movement (see insert), conceived and assembled exclusively by Rolex in 2000.



A typical Rolex event: Le Mans 24 Hours.

Rolex's association and long-term support of the Le Mans 24-Hour Race and its American cousin, the Rolex 24 at Daytona, in the 1950s, helped create the iconic image the Cosmograph Daytona enjoys today with race professionals around the world. Paul Newman famously received a Cosmograph Daytona from his wife, Joanne Woodward, with the inscription "Drive Slowly, Joanne" engraved on the case back. Newman may not have known exactly what was inside his Cosmograph Daytona when he reportedly wore it in the film Winning, but as an actor who was often judged by his arresting looks, he knew that there is nearly always more to an object of beauty than meets the eye.



#### THE MOVEMENT

The movement found in the Cosmograph Daytona is the perfect illustration of Rolex's watchmaking expertise. It is elegantly simple, incorporating a mere 290 components, far fewer than a standard chronograph. This exceptional architecture reduces complexity while maintaining chronometric precision and guaranteeing an improved reliability. Conceived and assembled exclusively by Rolex, the movement took more than five years to develop and features elements unique to Rolex, such as the blue Parachrom® hairspring. This level of innovation and expertise is found in watches across the entire Rolex range. ensuring that every watch is a masterpiece from the inside out.



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#### A TOAST

TO EUREKA!

TO A FUNDAMENTAL SHIFT

TO ASKING WHAT IF?

TO FINDING OUT WHY

TO SO CRAZY IT MIGHT WORK

TO THE GUTS TO TRY

TO SEEING THE INVISIBLE

TO ATTEMPTING THE IMPOSSIBLE

TO FINDING OBSTACLES INSPIRATIONAL

TO OUTSIDE THE BOX

TO OUTSIDE THE LINES

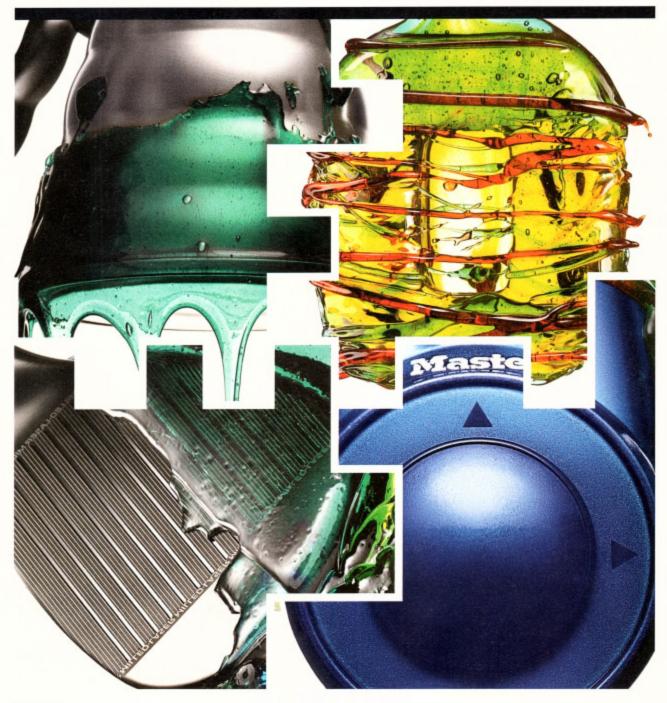
TO TAKING SMALL STEPS

TO BEING AHEAD OF OUR TIME

TO CELEBRATING THE VISIONARIES WHO MOVE US ALL FORWARD



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#### 101 Wish List 2010

Forget reindeer socks, cologne assortments, and nose-hair trimmers. We've got the ultimate gift list for the holiday season—from a cool coffee kettle to the most useful spork ever, barely legal golf clubs to a clever new padlock—100 items that are perfect for both the naughty and the nice. **PLUS:** a chance to win this year's Wish List gift bag.



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# The market may not go but we will.



<sup>\*</sup>SmartMoney magazine, June 2010. Industry review ranking 17 leading discount brokers. Results based on ratings in the following categories: commissions and fees, interest rates on cash, mutual funds and investment products, banking services, trading tools, research, and customer service. Criteria not equally rated.

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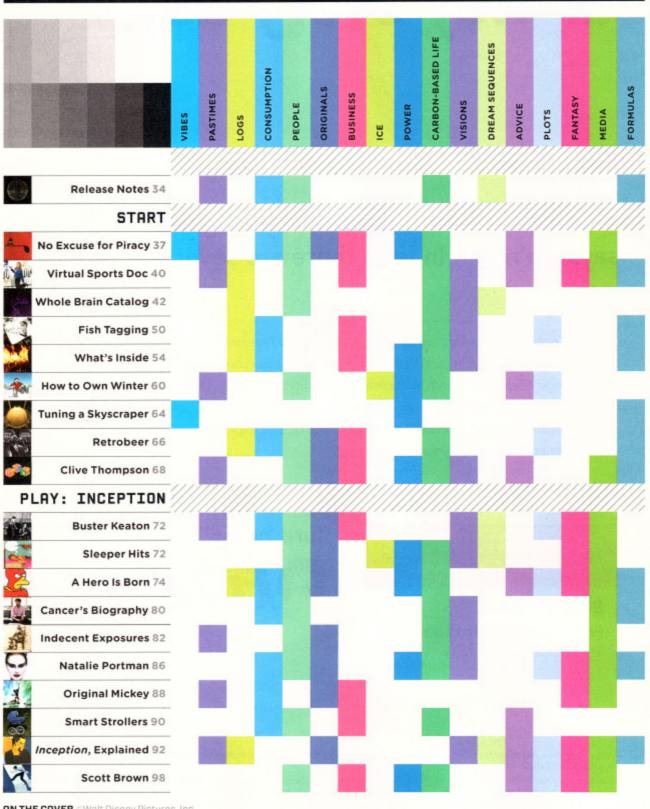
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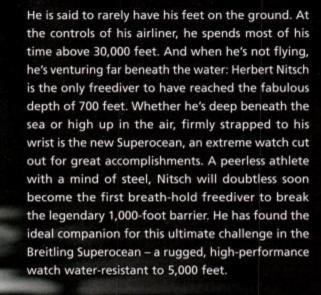
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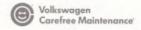
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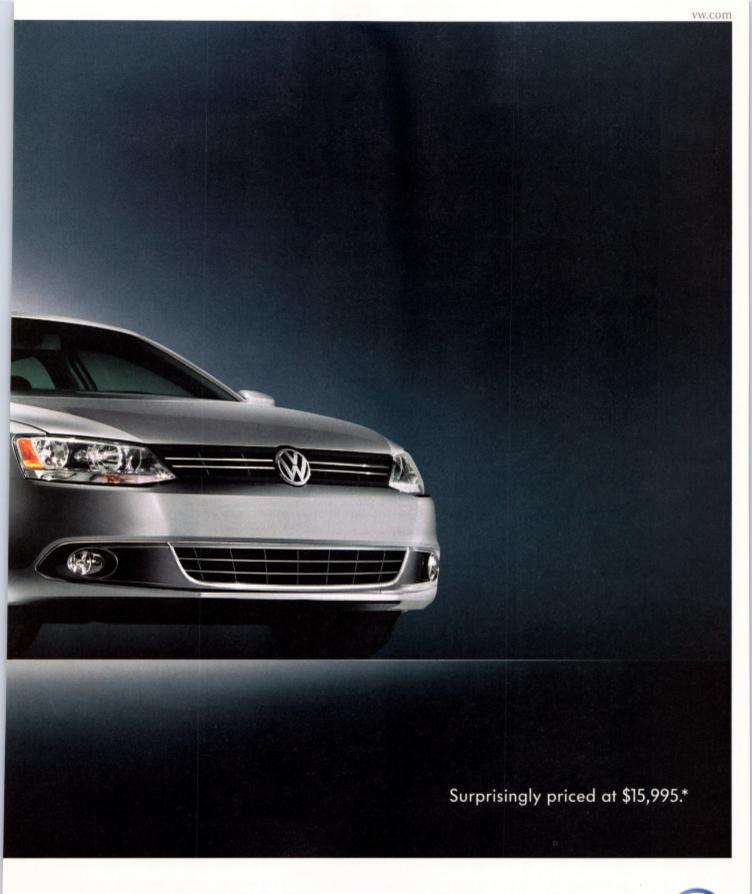
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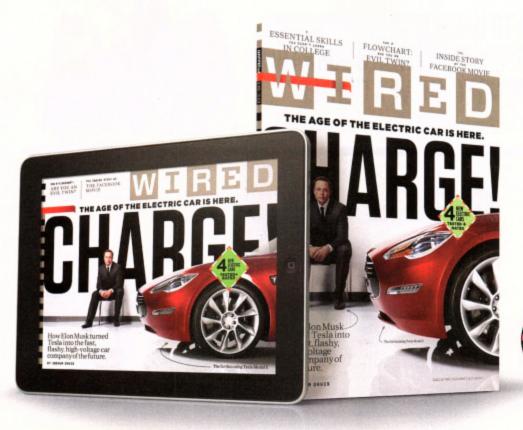
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## **18.12 Rants**



#### **COVER LINE**

Keen observers of the WIRED COVER over the past few years may have noticed the ribbon of color that winds from the spine to the front of the magazine. It's called the wrong bar, and it's part of a concept dubbed Wrong Theory: perfect a design, then make one wrong move, explains outgoing creative director Scott Dadich. "It's often done for tension. adds Dadich, who was recently tapped to lead Condé Nast's digital magazine efforts. "We'll add a color that's intentionally hostile to what's otherwise a pleasing design, or make type collide." For this month's bar, design director Wyatt Mitchell chose a gradient. Zoinks!



## **RE: The New American Car Company**

"I was weepy-eyed after reading your story on Tesla Motors," wrote @ericmwong on Twitter, responding to "Supercharged" by Joshua Davis (issue 18.10). "Makes me want to climb to the summit of the American dream. Truly inspirational." As the comment suggests, Tesla founder Elon Musk's success as a serial entrepreneur (Pay-Pal, SpaceX) moved many readers. "Elon Musk is the new Richard Branson," raved @mcconaghy on Twitter. Dan Haggarty

of Toronto declared that Musk's career offers "a glimpse of American ingenuity at its best." (Even though Musk is South African.) But Haggarty had a critique, too: "The article offered only the most oblique reference to the current Achilles heel of electric cars—charge rate," he wrote. "An ideal electric car would need to charge at a level 100 times the amp service of a typical home. Electric cars may be in our future, but without a solution to the recharging elephant in the room, they'll only be a niche product for an urban elite."

Also from Toronto, Calvin Schnurr offered: "Neatly tucked away in the piece is the point that more electric cars will drive electricity demand. I'd enjoy reading an article about how



that demand would be met, or whether it in fact can be. Even an electric car isn't a silver bullet for North America's energy limitations. Figure that out, then maybe wire can talk about the arrival of a new age."

There was also concern about Musk's ability to build Tesla Motors into a mainstream carmaker. "History is not in his favor," noted **MWILK** on Wired.com. "How many successful car companies have been started from scratch in the past

30 years? Building a clever prototype is one thing; massproducing it is quite another. More power to Musk if he makes this work, but I wouldn't bet your kid's college fund on Tesla."

Then came the outright naysayers. On Wired.com, **BORI-QUAJAKE** called the piece "more shameless fluff for what is essentially a giant tax write-off." Others complained about the cost of the Tesla cars: "They left some words out of the title. It should say 'Really Expensive Luxury Car Company of the Future,' "wrote **CARLSPEAROW**. Let's be fair: The Model S starts at \$49,000. Not cheap, but not totally outrageous. In our book, a really expensive luxury car is a Bentley Continental Supersport. Sticker price: \$267,000.

## **18.12 Rants**

RE: "SURVIVAL GUIDES" (PLAY, ISSUE 18.10)

#### "IT'S A GOOD IDEA TO HAVE LOTS OF BOOKS FOR THE APOCALYPSE. YOU CAN ALWAYS BURN THEM FOR HEAT, ASSUMING YOU HAVE A LIGHTER."

Excerpted from a comment posted on Wired.com by THRODOWN



#### DON'T TRY THIS AT HOME





If you read this magazine on an iPad or our website, you may have seen a video featuring the Hallmark Dummy Launcher, October's Most Danger-ous Object in the Office. To help create the footage, contributor Rachel Swaby got behind the trigger of what's essentially a gun that shoots dummy ducks to help hunting dogs practice retrieving. Trouble is, our office isn't in open marshland. It's in a converted warehouse in San Francisco and has these things called walls. Shooting the dummy duck gun created sizable holes in the drywall. Note to Barbara in Facilities: We're really, really sorry!

#### Power Struggle

Bill Freeland of Littleton, New Hampshire, was among the readers questioning the environmental benefit of electric cars ("Tested & Rated: Electric Cars 2010," issue 18.10). "When you factor in the emissions generated by the electricity they use, it makes what you're calling a 'transformative' moment seem just a hyped exaggeration," Freeland wrote. "There is no free ride for any automotive technology based on fossil fuels, whether the power comes from an oil refinery or a power plant." We're familiar with this argument, and while it's compelling, it's also been disproven: A study from the Electric Power Research Institute and the National Resources Defense Council concluded that widespread adoption of plug-in hybrid vehicles would reduce greenhouse gas emissions between 40 and 65 percent over conventional cars. Our enthusiasm remains unbridled.



#### Made-in-China Syndrome

The recession may be technically over, but our readers are still feeling the pain. In "The Nerd Superstore" (issue 18.10), contributing editor Mathew Honan mentioned that ThinkGeek has its quirky gifts for nerds manufactured in China. "Yet another American company getting rich on the backs of 15 million Americans out of work," wrote Craig Summers of Hollywood, Florida. "It's time for Congress to tell the Fortune 500 to bring jobs back home or face serious taxes on their overseas adventures."

Fair point, but it will be a while before ThinkGeek makes the Fortune 500. What's more, the company doesn't feel the need to apologize. The response from ThinkGeek's president and general manager, Caroline Offutt:

"We want the US economy to succeed and the number of jobs to increase, but it's one thing to say shut down all relationships with the world and another to do something about it. We recently moved our warehouse to Ohio. which has been hard-hit by the economic downturn. We are rapidly hiring at our Virginia headquarters, and we pay our taxes in the US. Yes, we have manufacturing partners in China, but we also have domestic suppliers. Our net impact on the US economy is a positive one."

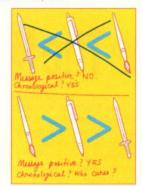
#### If You Sell a Man a Fish

The best way to help developing nations is to sell them inexpensive stuff that works, wrote David Wolman in "Pretty Pennies" (Start, issue 18.10). PAWN-MAN offered this praise on Wired.com: "This is what business has been saying for yearsyou can't just mail checks to the poor until they are rich. You have to give them a way to sustain their own standard of living

through economic development." But ONLYONETIMEUSE on Wired.com suggested that the poor in developing nations should "stop whining and get a job!" If only it were that simple.

#### Reverse Psychology

Sometimes the best way to solve problems is to draw them, wrote Clive Thompson in "Think Visual" (issue 18.10). The rightbrained crowd cheered, but one Photoshop fan quibbled with our illustration, by Posttypography. Herewith, a visual critique from Madhavan Raghavan of Coralville, Iowa:



#### UNDO

"Applied Cognition" ("Welcome to Wired University," issue 18.10) was written by Robin Sloan, not Alexis Madrigal. D.light has sold more than 250,000 LED lamps, not 20,000 as reported ("Pretty Pennies," Start, issue 18.10). Charles Randall was incorrectly identified as Chris Randall in "Zyngaphobia," (Play, issue 18.10).

EDITORIAL CORRESPONDENCE rants@wired.com







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## 18.12 Release Notes



### Magnets—We Know How They Work

LATELY WE'VE BEEN OBSESSED with Buckyballs, those tiny magnets that can be worked into almost any shape (though some prefer competitor Zen Magnets). Editorial operations manager Jay Dayrit is the office Buckyballs master: His many creations (examples, above right) put the rest of us to shame. Turns out New York-based photographer Spencer Higgins is a fan as well. He was hired to model and photograph molecular structures (above left) for John Bohannon's "Building a Parallel Universe," about hacking DNA to grow a mirror image of life on Earth (page 208). "I thought about tons of different materials—glass, styrofoam—before I hit upon Buckyballs," Higgins says. "I've never worked in that medium before."

#### Test Results

There's a great tradition in design: Take an everyday artifact—a boarding pass, a subway map—and give it an infographic makeover. The best of these efforts transform designed-by-committee jumbles into clear, functional, even elegant new formats. After a recent visit to the doctor, executive editor Thomas Goetz was inspired to overhaul the lab reports of medical tests. To ensure the outcomes were indeed clear, functional, and elegant, wired art director Tim Leong tapped three illustrators, and writer Steven Leckart consulted with a team of medical experts. See the redesigns on page 200.



#### INTERPRETING INCEPTION

We're not saying that any illegal downloading goes on at WIRED. But if, hypothetically, a copy of the movie Inception happened to fall off a truck and come into our possession, we would put it to good use. A few editors would perhaps watch the film, in which characters move fluidly through time and space, close to 20 times. The geekiest among them would spend hours and reams of paper untangling the plot, realigning the action so that each scene takes place in parallel time (strictly for reference purposes, of course). And we would distill all that analysis into a super awesome infographic on page 94. OK, that very last bit isn't entirely hypothetical.

#### THE CANDYMAN



Those colorful numbers scattered throughout our Wish List holiday shopping guide (page 101) aren't just pretty, they're also edible. Photographer Massimo Gammacurta of New York combines sugar, corn syrup, water, and food coloring to make candy. He dips, freezes, or molds the confection and plays with humidity and temperature to get the effects he wants. "The pieces are not predesignedthe sugar dries quickly, so everything is done fast. Gammacurta says, And how do they taste? "Very sweet. Once I'm done, I eat one or two just for fun."

WIRED

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# No Free "Freebird"

All your excuses for pirating music have been nuked—by record companies!

BY PAUL BOUTIN

date: The age of stealing music via the Internet is officially over. It's time for everybody to go legit. The reason: We won. And all you audiophiles and copyfighters, you know who fixed our problems? The record labels and online stores we loved to hate. 9 Granted, when Apple launched the iTunes Music Store in 2003 there was a lot to complain about. Tracks you bought on computer A often refused to play on gadget B, thanks to that old netizen bogeyman, digital rights management. (It's crippleware!) My local Apple store was actually picketed by nerds in hazmat suits attempting to educate passersby on the evils of DRM.



▶ Well played, protesters: In January 2009, Apple announced that it would remove the copyright protection wrapper from every song in its store. Today, Amazon and Walmart both sell music encoded as MP3s, which don't even have hooks for copyright-protection locks. The battle is over, comrades.

A few years ago, audiophiles dis-

Music is so cheap.

there's no reason

many downloads

send 20 cents

not to buy. Besides.

straight to the band.

missed iTunes' 128-Kbps resolution as anemic, even though it supposedly passed rigid blind testing against full-bandwidth CD tracks of the same song. The sound is compressed, connoisseurs said. The high end is mangled. Good work, audiophiles: Online stores have cranked up

the audio quality to a fat 256 Kbps. To most ears, it's indistinguishable from a CD. (Actually, most ears are listening through crummy earbuds anyway, but whatever.) It's certainly better than most of the stuff out on BitTorrent. If you still hate the sound of digital music, you probably need to go back to vinyl. You can get a pretty good turntable for around \$500. Which, I'll just point out, is not free. And when you steal vinyl records, it's called shoplifting.

Haters might get a bit more traction with the gripe that official stores still don't carry every track ever recorded. You won't find, say, AC/DC or the Beatles in iTunes. For other artists, contract restrictions mean some songs can't be downloaded in every country, which indeed seems dumb for a store on the border-free Internet. Americans, for example, can't buy Daniel Zueras' 2007 Spanish hit "No Quiero Enamorarme" from the iTunes store for Spain. Still, the available inventory keeps growing, including artists' back catalogs. I recently discovered that Salt City Orchestra's limited-edition, vinyl-only 1997 nightclub fave "The Book" has been kicking around iTunes since 2008. Way back in the day, I had to trade favors with a pro DJ to get that record. It's getting

harder and harder to find the few holdouts to hang a reasonable complaint on.

That leaves one last war cry: Music should be free! It's art! Friends, a song costs a dollar. Walmart has pushed some of its MP3s down to 64 cents. At Grooveshark, you can sample any song you want before you buy. Rdio charges \$5 a month for all the music you can eat,

served up via the cloud.

So there's really no reason not to buy—and surely you understand by now that there are reasons why you should. When you buy instead of bootlegging, you're paying the band. Most download retailers send about 70 percent of each sale to the record

companies that own the music. Artists with 15 percent royalty deals get 15 percent of that 70 percent, or about 10.5 cents per dollar of sales. Those who write their own music and own their own music publishing companies—

an increasingly common arrangement get another 9.1 cents in "mechanical royalties." Every download sends almost 20 cents straight to the band.

A recent court ruling against Universal

Records—and in favor of the rapper Eminem—might even lead to downloads of older music being treated not as sales but as licensed music. (Newly written contracts tend to address digital music sales directly.) That would bump the artist's split with the label from around 15 percent to an average of 50 percent. If that happens and you can still rationalize not throwing four dimes Eminem's way, then maybe there's another reason you're still pirating music: You're cheap.

PAUL BOUTIN (paulboutin@mac.com) wrote about letting small investors in on pre-IPO deals in issue 18.07.

.....



#### Land of the Rising Disc

Washed-up hair metal bands aren't the only thing that's still big in Japan. The aging CD format is faring better there as well. Despite having only about a third as many people as the US, the island nation is the world's number one market for music CDs, with annual physical media sales of \$3 billion (compared to \$2.6 billion stateside). Here's why plastic discs are hanging on in Japan. —WILLIAM HOCHBERG

#### UPSELLING

Fans are willing to shell out enormous sums for premium packaging. Eighties J-pop superstar Seiko Matsuda's box set sells for a jaw-dropping ¥100,000 (\$1,200).

#### REPURCHASING

Replaced your LPs with CDs? Now you can replace those in turn with a new line of "cardboard reissues," CDs packaged in stiff paper envelopes featuring original LP artwork.

#### RENTALS

Chains like Tsutaya, the Blockbuster of Japan, rent CDs as well as DVDs. Every store needs to buy a healthy stock of hit discs. (They all pay copyright royalties, too.)

#### EXPENSIVE DOWNLOADS

iTunes' baseline for singles is ¥150 (\$1.80), but Apple has less than 10 percent of the market. Many services charge ¥300 (\$3.67) and up.

#### LESS PIRACY

The cell phone, not the PC, is the primary music-downloading device in Japan—and it's tough to get BitTorrent on a DoCoMo.

#### DATASTREAM INFAMOUS INFOMERCIAL MERCHANDISE (UNIT SALES)

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# Doc for Fake Jocks

An orthopedic specialist provides real medical analysis for fantasy sports teams.

If Saints quarterback Drew Brees should develop a case of tendinitis, the ramifications would be enormous—and not just for his team's upcoming football games. It would also rock the millions of fantasy football games that Brees is slated to play in. Like their real-world counterparts, virtual team owners need to know just how badly their star athletes are injured and how long recovery will take. But the injury reports that teams release are vague, incomplete, and full of spin.

That's where Stephania Bell comes in. Switch on ESPN2 or surf over to ESPN.com before kickoff and you'll see the network's official fantasy sports injuries analyst dispensing hyperdetailed prognoses that help armchair Jerry Joneses rejigger their rosters. Bell, an orthopedic clinical specialist with 19 years of sports-medicine experience, was just a run-of-the-mill fantasy football fan five years ago. But she took advantage of her expertise to scrutinize footage of injuries and decipher the official reports.

This turned into a series of articles on enthusiast sites and commentary on XM radio sports shows. Then she was called up to the majors. Now she does regular stand-ups on ESPN's Fantasy Football Now and blogs for the network about the finer points of Reggie Bush's fractured

fibula. Sports fans ignore her diagnoses at their peril-reconfiguring your imaginary lineup based on her instincts can really pay off. Take last season, when Atlanta Falcons running back Michael Turner suffered a high ankle sprain but was back on the field in two weeks. "There was no way he was fully recovered," she says and told viewers as much. "Running backs take a lot of stress through the ankles, and Turner's a stout, powerful guy. I knew he was going to be in trouble, and he was." Sure enough, Turner underperformed in his first game back, got hurt again, and was taken out. He should have spent less time listening to his trainer and more time watching cable TV. -AMANDA SCHUPAK

#### JARGON Watch

#### Hygroelectricity

n. Power collected from humid air. By tapping into charged atmospheric moisture, hygroelectric panels promise to provide clean energy—especially in muggy areas—while simultaneously dampening the fury of thunderstorms.

#### Sharejacking

v. Scamming the Facebook community by hijacking the Share function. Sharejackers induce people to pass phishing surveys on to their friends by hiding the Share button under a fake Next tab. A second variant does the same thing with the Like feature.

#### Zarmina

n. Unofficial moniker of the "Goldilocks" planet, Gliese 581g. Zarmina, named for the earthling wife of discoverer Steve Vogt, is the first heavenly body found with a climate that's just right for humans.

#### Zombie DNA

n. Noncoding genes that get activated by mis-transcription and trigger disease. Zombie DNA has recently been found to cause one type of muscular dystrophy, the first known case in which a "dead" genetic sequence has gone live.

—Jonathon Keats (jargon@wired.com)



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THE ART OF DESIGN

# **Free Brains**

A videogame engine gives everyone access to footage of neurology in action.

Neurons firing

in the dentate gyrus.

Mark Ellisman wants neuroscientists to share. Typically, they don't: Data on brain structures, painstakingly accumulated using neuroimaging technologies and dissections, usually belongs to individual researchers, labs,

and journals. So Ellisman, a neuroscientist at UC San Diego, started working on the Whole Brain Catalog, an open source, open-access database of mouse brain imagery. Think of it as Google Earth for rodent neurology—if Google Earth were based on a videogame engine and could zoom from the scale of a continent to a ladybug. "That's the range we traverse, but in 3-D," Ellisman says.

Download the software and you get visualizations and videos ranging from the structure of the entire brain to individual neurons. And many of the renders link to the data they're built from, like the massive (and massively well-funded) Allen Brain Atlas or the Neuroscience Information Framework, run by the National Institutes of Health. A handful of labs have also donated their work—the Salk Institute's Fred Gage contributed a 2-D simulation of nerve cell growth in adult mice, and Ellisman's team adjusted the pacing to run in real time, eventually posting it to the catalog as a "4-D simulation."

Today the database totals 3,595 images and videos, including recently added views of the retina and optical nerve. A whole new version of the WBC is due out in December. Eventually the videogame engine—it's Java Monkey, the underpinning of a bunch of addictive web games—will do even more. Nothing brings a research lab together like a fly-through of the hippocampus in PvP mode. —Allison Davis



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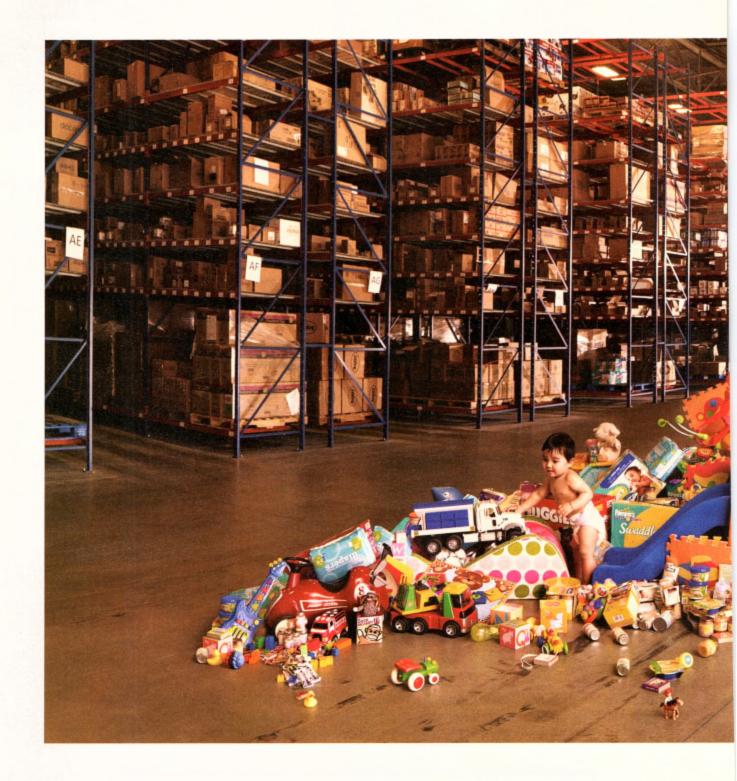
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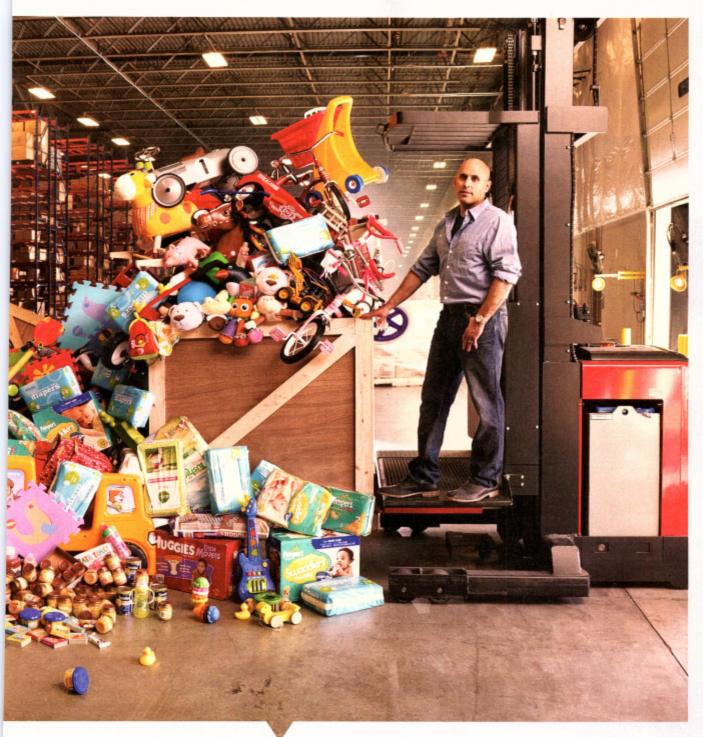
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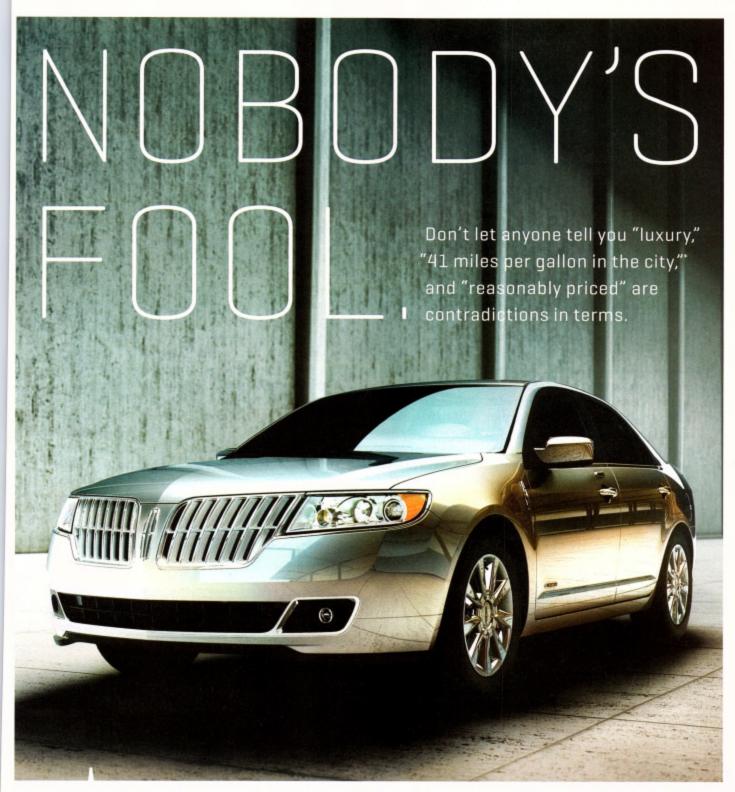
My pregnant wife and I live in an old house that contains lead paint and lead pipes. My mother-in-law insists that we move. Should we?



SECOND CHANCES are as American as monster trucks and deep-fried Coke. Just look at the popularity of Celebrity Rehab. According to your mother-in-law, though, old buildings don't deserve the same shot at redemption as Heidi Fleiss. She believes that antique abodes can never be rehabilitated, no matter how much money you pour into renovations. I There's a grain of truth to her logic: Try as you might, you can never make your house entirely lead-free. But in her zeal to protect her unborn grandchild's brain, your mother-in-law has erroneously assumed that the mere presence of lead guarantees tragedy. "The thing you really need to look out for is any peeling or chipped paint or any dust around windowsills," says Anne Turner-Henson, a professor at the University of Alabama at Birmingham School of Nursing, where

DATASTREAM YEARS IN WHICH DYSTOPIAN FILMS ARE SET

RKIRA: 2019 // BLADE RUNNER: 2019 // CHILDREN OF MEN: 2027 // DEMOLITION MAN: 2032 // ESCAPE FROM NEW YORK: 1997 // IDIOCRACY: 2505 // JOHNNY MNEMONIC: 2021 // METROPOLIS: 2027 // MINORITY REPORT: 2054 // ROBOCOP: 2015 // ROLLERBALL (ORIGINAL): 2018 // SLEEPER: 2173 // SOYLENT GREEN: 2022 // TOTAL RECALL: 2084 // 1984: 1984



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▶ she focuses on youth health. If you can repaint the place, or at least hire certified professionals to address those problem areas, then all should be fine; intact lead paint isn't a hazard, especially if it's sealed beneath layers of nontoxic stuff. As for the pipes, get your water tested; if it's unsafe, invest in a reverse-osmosis purification machine, put in new pipes, or commit to buying bottled water by the truckload.

So go ahead and ignore your mother-in-law, but be sure to remain vigilant. Once the kid drops, you should regularly check for flaky paint and suspicious dust, and make sure your pediatrician tests your progeny for lead at regular

intervals. Too lazy for that regimen? Then perhaps you'd better start looking for shelter built after the Carter administration.

I spend almost all my phone time on my cell these days, so I'm tempted to cancel my landline. But will I rue that decision when disaster strikes? I'm worried that the mobile network will get knocked out.

There's a reason to be wary of ditching your landline, but it has nothing to do with reliability. Cell towers are now robust enough to stand up to Mother Nature's bullying. "As we saw after the Haiti earthquake, mobile networks are building up their resiliency," says Craig Fugate, director of the Federal Emergency Management Agency. "People were using cell phones to stay in touch."

What should give you pause is the fact that, unlike landlines, cell phones don't automatically provide 911 operators with your home address. That could be a problem if you ever need help but can't talk—

> say, if you're in the midst of a heart attack or you're hiding in a closet because your house has been overrun by cyborg assassins.

> In such cases, the authorities might still be able to track you down (depending on your mobile carrier) using GPS

or—provided you're within range of three cell towers—triangulation. You may also be able to register your cell number and address with local emergency services—though that can cause confusion if you dial 911 while out and about.

So is it worthwhile to keep a landline? If you're young and healthy, several hundred bucks a year may seem steep for peace of mind. Maybe you'd do better to spend the cash on something that'll minimize your odds of ever needing 911 in the first place. A gym membership could help stave off a heart attack, for example. And a spikefilled moat might frustrate the cyborgs.

# As part of an ongoing midlife crisis, I'd like to pursue my childhood dream of flying around with a personal jetpack. How can I accomplish this? Do I need FAA clearance?

There is surprisingly little red tape between you and a rocket belt. Assuming that whatever unit you get your hands on weighs no more than 254 pounds, carries 5 gallons or less of fuel, and zooms forward at no more than 63 miles per hour, the FAA will consider it an ultralight vehicle. That means you don't need a license to operate it—you just need to obey certain regulations, like avoiding populated areas and confining your flights to daylight hours.

The real trick here isn't satisfying the bureaucrats but rather coming up with the hardware. A few companies have vowed to start selling off-the-shelf jetpacks in the not-too-distant future, for prices starting around \$100,000, but their plans always seem to encounter delay after delay.

Of course, you could always build your own. Do you have a strong background in aerospace engineering and a garage full of advanced fabrication tools? If not, consider scaling back your dreams just a tad. There is no shame in parasailing.

Need help navigating life in the 21st century? Email us at mrknowitall@wired.com.

# FOLICE DEPT NEW HAVEN CONN 53720 10-19-10

#### Tattoo Detectives

Cover up! That body art could give you away. Crooks may wear gloves and masks to hide their identity, but few think to cover their ink. If there's a video record of a crime, cops can sometimes use exposed tats to identify a perp or at least his gang affiliation. But trying to match a specific piece of inkwork against a vast photo database has been like searching for an image on AltaVista in 1998. Police have relied on archaic keyword tagging ("animal," "female face," and that old

favorite, "other"). "It doesn't work very well," says Michigan State University biometrics expert Anil K. Jain, who received FBI funding to develop an alternative tentatively called Tattoo-ID. Jain's software quickly compares a suspect's tattoo (lo-res sources like surveillance footage or a cop's phone camera work fine) with tens of thousands of tattoos from known criminals. Like fingerprint-ID software, it works by matching telltale visual features in the images themselves. The tech has been licensed by a firm called MorphoTrak, which will start beta-testing it with state and local law enforcement in December. Hoodlums had better invest in some long-sleeve turtlenecks. —Marina Krakovsky

**BLASTING DESIGN BY RADO** 

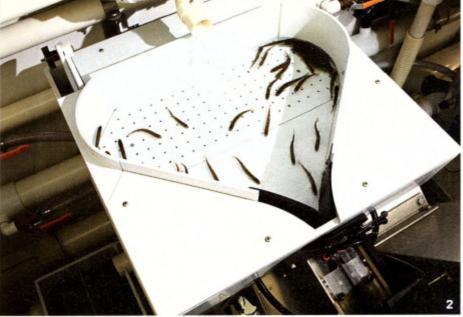
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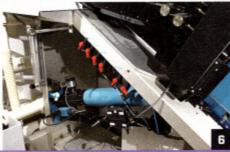
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PROCESS

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Spooled tagging wire



iPad Extra: To see AutoFish in action, download WIRED from the iTunes Store.

The US government's fish-tagging operations used to be a lot like its intelligence-gathering: slow, imprecise, and occasionally responsible for the torture and death of innocent subjects. No more. The Fish and Wildlife Service now uses AutoFish, a mobile system that employs sensors, cameras, and computer algorithms to inject microscopically coded tags into 60,000 fish a day—without removing them from the water. Each \$1.3 million automated rig is part of a program to ID-tag the millions of hatchery-raised fish that the US releases into the Great Lakes every year. The tags will

provide fishery managers with comprehensive data that'll help them boost low populations, avoid overstocking, and even satisfy Native American treaty obligations. Here's how it works.—DAMON TABOR



#### 1. INTAKE

Pumps suck young fish, called fingerlings, into a holding tank in the AutoFish trailer. Another pump then carries them to what's called the volitional entry system; a computer monitors a video feed to regulate flow.

#### 4. FIN-CLIPPING

A picture is transmitted to the computer to ensure correct positioning, then a stainless steel blade harmlessly slices off the vestigial adipose fin. This will enable fishermen to identify the fish so the tags can be collected.

#### 2. FORMING A LINE

Using water current and the fish's inclination to seek shade and deeper water, the fingerlings are funneled through a gate. When one enters, water jets slow the fish behind it to ensure they pass through single file.

#### 5. TAGGING

Simultaneously, a 24-gauge needle inserts a 1.1-mm-long steel wire into the fingerling's snout. Etched with a six-digit code, this tiny tag will provide scientists with a raft of data, like hatchery of origin and release date.

#### 3. SIZING 'EM UP

Images of each fish are analyzed by the computer to calculate length. Gates to different pipes open according to size. At the end of the line, the fish are grabbed and held in place by foam clamps and a head mold.

#### 6. VERIFICATION

As the fish swim back through a pipe to the hatchery pond, a magnetic sensor checks to make sure the tag has been inserted correctly (rejects are diverted for a redo). The entire process takes roughly 2.4 seconds per fish.

Smarter business for a Smarter Planet:

# What 3 million lines of code means to a piece of luggage.

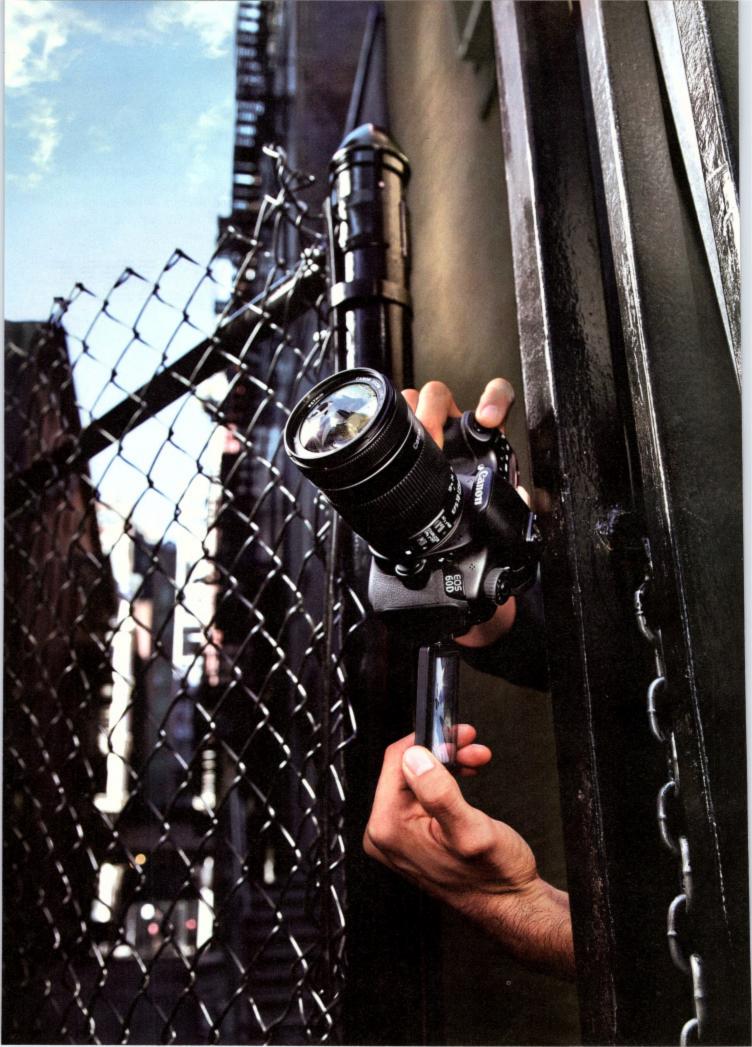
It means Amsterdam Airport Schiphol will be able to accurately and efficiently move 70 million pieces of luggage per year—20 million more bags per year than they used to. The airport's automated baggage solution will allow them to increase their baggage handling capacity by 40%, so they can meet the growing demand placed on them as one of Europe's largest transport hubs. This system is built on IBM Rational® and Tivoli® software and runs on Power Systems." A smarter business is built on smarter software, systems and services.

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Canon image ANYWARE

# Birdseed Popping on an Open Fire

WHAT'S INSIDE COLORED-FLAME ARTIFICIAL LOGS

#### BIRDSEED

Natural logs (especially pine) crackle as the moisture and oils in the wood reach their boiling points. To duplicate this effect, some fire logs contain a little birdseed (hemp, millet, coriander, or flax), which is also prone to pop when burned.

#### METALLURGI-CAL COKE

Coal with its volatile components—
water, gases, coal
tar—baked away.
It can be ground
into 4-mm particles
that sputter when
heated.

#### HOLLOW

When these glass, ceramic, or polymer orbs are heated, enormous pressure builds up from the little bit of moisture or air inside. Eventually the outer shells explode—just like birdseed.

#### PARAFFIN

About half of the weight of a fire log is wax, usually inexpensive petroleum-based paraffin. It serves as a fuel, a binder for the other ingredients, and a structure for the log itself. Essentially, you're burning a giant candle.

#### WOOD

Fake logs are still about 40 percent real plant cellulose. (Duraflame started as a way for California Cedar Products to make use of leftover sawdust.) Typical cellulosic material might be bark, cardboard, peanut shells, or coffee grounds.

#### NON-PETROLEUM WAXES

Some newer fire logs claim to be sustainable. They still use wax, but instead of stuff that's pumped out of the ground, they use wax from rain forest plants (carnauba), pine trees (tall oil, a liquid rosin), or animals (tallow).

#### LITHIUM CARBONATE

Flames make electrons absorb energy, jump to a higher orbit, and then come crashing down, emitting photons of light. Burning Li<sub>2</sub>CO<sub>3</sub> creates flames at a wavelength that we perceive as an exotic red.

#### POTASSIUM

Salt substitute, sidewalk-ice melter, and the "lethal" part of a lethal injection, KCI burns with a delicate blue-violet flame.

#### COPPER CHLORIDE/ COPPER CARBONATE

Geeks who etch circuit boards swear by CuCl<sub>2</sub>. CuCO<sub>3</sub> is the green coating on old pennies. The copper electrons in both emit electric blue. — Patrick Di Justo



PHOTOGRAPH BY TIM MOTTIS



#### IT'S TIME TO LOOK AT THE WORLD FROM A UNIQUE PERSPECTIVE.

Introducing the new Canon EOS 60D. Featuring our first ever 270-degree 3.0-inch LCD screen that allows you to express yourself from any angle, whether it's an extreme high angle, low angle, or even self-portrait. And with an 18 Megapixel CMOS sensor, 5.3 fps shooting and multiple aspect ratios, you'll capture stunning photography from every direction. Then see beyond the still in 1080p Full HD video.

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# Science for All

The institutions that foot the bill for scientific research tend to be best at writing big checks for big projects. Now a bunch of nonprofits are trying to fund the little guys, asking for small donations to small projects. A focus on transparency—researchers must update donors with progress reports—could help get the public invested in science with their hearts as well as their wallets. Here's a look at the new funds. —ERIN BIBA



#### **FundScience**

HOW IT WORKS: Microdonations to individual projects or organizations, with a time limit on the fund-raising. Projects that don't hit their targets have their funds redistributed. WHAT MAKES IT DIFFERENT: Fund-Science takes donations from individuals and organizations alike. SAMPLE PROJECT: Researchers at the Center for Genomic Sciences are looking to study a nasty strain of antibiotic-resistant pneumococcus bacteria-the most common cause of bacterial meningitis. AMOUNT RAISED: \$2,500 STILL TO RAISE: \$22,500

#### EurekaFund

HOW IT WORKS: Microdonations to individual projects until funding goals are met.

WHAT MAKES IT DIFFERENT: A focus on research that could benefit people living in poor communities or the developing world. A scientific advisory board reviews all grant proposals. SAMPLE PROJECT: A testing facility for inexpensive solar panels, to be built on the UC Berkeley campus. AMOUNT RAISED: \$25,351
STILL TO RAISE: \$47,229

#### SciFlies

HOW IT WORKS: Microdonations with a financing deadline. If a project doesn't meet its funding target, donors can choose to transfer their contributions to other research.

WHAT MAKES IT DIFFERENT: As part of its effort to make science accessible to all, SciFlies pairs researchers with professional science writers to make their proposals easier to understand. SAMPLE PROJECT: A network of robotic sensors for Tampa Bay to measure chemical changes in the water caused by flushed-away pharmaceuticals. AMOUNT RAISED: \$0 STILL TO RAISE: \$12,000

#### Most Dangerous Object in the Office This Month: GreenSteam Weed Killer

D'oh! We left a cup of coffee on our desk—last Presidents' Day. A scouring pad will never kill all the germs living in this mug, but a blast of scalding steam at 930 degrees Fahrenheit just might. The GreenSteam Weed Killer is a propane-powered beast that flash-boils water in about half a minute, then disgorges it through a stainless steel nozzle. The 10-gallon tank provides enough blistering mist to wilt thousands of weeds—or sterilize a whole break room full of moldy dishware. Doing good deeds is so rewarding. In fact, the office manager's shirt is looking a little wrinkly...—Steven Leckart



IPad Extra: To see the weed killer in action, download wired from the iTunes Store.



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# **MEDIAMAESTRO**

**Q&A WITH BLAISE ZEREGA**, CEO OF FORA.TV

Passion. Perseverance. Experience. All these factors come together when a creative innovator takes an unbeaten path to reach further than he ever dreamed he could.

This interview series showcases business leaders who forged their own way ahead to create successful careers and live a rewarding life that's worth the effort. Learn more below about the passion, challenges, and rewards that fuel Blaise Zerega.

#### Q: Tell me about FORA.tv.

A: There are brilliant ideas being expressed every day, everywhere around the world, but unless you're physically present you can't enjoy them. FORA.tv gathers these ideas and makes them available to anyone, anywhere, however they want them-on their TV, on their smart phone, or on their computer.

#### Q: What inspired you to leave traditional media and to go this particular route?

A: The use of video to connect to an audience really excited me. Audiences can interact with content in new ways and that is incredibly energizing. In the old days, content was always at arm's length, but online video can be shared and as it circulates around the web, the responses travel with it. At FORA.tv we have intelligent content that inspires discourse and debate.

#### Q: What motivates you on a daily basis?

A: Engaging with the FORA.tv audience and interacting with them. They inspire me. I have one of the most stimulating jobs in the world where I constantly see new ideas coming over the transom every day. With technology changing so quickly, we're at the forefront of an explosion in online video, and for a nimble little start-up to be at the center of this revolution is exhilarating.

#### Q: What has been your favorite aspect about being CEO of FORA.tv?

A: Being able to translate an idea to action. What's wonderful about the web is you can do things so quickly, if you want to try something out, you can make it happen today. If it doesn't work, you can take it down same day. As a longtime technology writer and editor, I had watched companies from their genesis and throughout their growth, analyzing what they did right and wrong. Now I can put a lot of the lessons I observed into practice. I'm on the other side of the table and that's rewarding.

#### Q: How do you reward yourself at the end of the day?

A: One of my pleasures is to just shut the door and watch a video [at FORA.tv]. Just by myself and absorb it and be stimulated by it as a consumer, not as a CEO.

#### Q: What makes FORA.tv so worthwhile for you?

A: Ten years ago you would walk into someone's office and they would have books full of great ideas. Now you can see the authors speaking about their ideas. It's a whole new experience watching one of your favorite authors, who you feel like is talking directly to you. Better than reading one of their books. It's a new way to connect to an audience and I love it!



"I have one of the most stimulating jobs in the world."

- Blaise Zerega

- · Master's Degree in English from the University of Texas
- · Attended NYU and West Point
- · Active in San Francisco start-up community
- · Passion for cycling, fly-fishing, music, and reading



#### Reimagined. Redesigned. Remarkable.

AK-47: How a Gun Changed the World TESTED: 39 Best Gadgets of 2010 Who Really Invented the The Plot to Overthrow Computer? Ticketmaster by Sharon Begley Who needs implants? How tissue engineering will radically enhance the future of medicine.



# **How to Own Winter**

Hibernating by the fireplace is fine and all, but if you really want to enjoy the season, you'll need a few ways to dominate Jack Frost. —Bob Parks



#### DRIVE ON A FROZEN LAKE

The glassy surface of an iced-over pond is perfect for power slides. Just keep your window down in case you take a plunge and need to escape. Here's how to do it (at your own risk).



#### 1. TAKE A SAMPLE

With a 5/8-inch wood auger bit, drill through the ice, then stick a tape measure down to gauge thickness. You need 7 inches of clear ice to support a 2-ton compact car. An H2 needs 9 inches.



#### 2. OUTLINE A COURSE

Take depth measurements every 150 feet along the path you'll travel. Drive only on tested areas to avoid thin spots caused by pressure ridges, natural springs, and hidden culverts.



#### 3. RELEARN HOW TO DRIVE

Practice correcting for slides. To corner effectively, use more gas pedal than brake. If you oversteer, don't stomp on the brakes—accelerate smoothly and turn the wheel in the direction of the skid.



- 1. LAY A GRID ON TOP
  OF THE PAVEMENT
  Wrap lengths of nickel
  chromium wire around
  masonry nails and stretch
  them across your driveway in parallel lines,
  2 inches apart. Solder
  these on each end to perpendicular copper wires
  running down both
  sides of the driveway.
- 2. PROTECT ALL THOSE EXPOSED WIRES Cover the grid with a mix of fine sand and driveway sealant; it may take a few coats. Or hire a contractor to pour on some slurry seal for greater durability.
- 3. ADD A POWER SOURCE
  Use a pair of (identical) transformers to step down 120-volt house current to about 100 amps at 20 volts—enough to clear some snow but not so much as to melt your radials.
- 4. COMMENCE
  MELTING
  Juice your driveway at
  the first sign of flurries.
  The system melts about
  an inch of snow per hour,
  which should keep your
  space clear through even
  the worst of storms.

#### Make an Igloo

 PACK THE SNOW To replicate the dense, wind-packed snow that Inuits use, shovel it into a 2-foot high, 10-footsquare sheet cake and stomp it down with snowshoes.

Wait a few hours. **2. SLICE THE BLOCKS** Using a carpenter's saw, cut blocks roughly 2 feet long, 1 foot wide, and 1.5 feet high. Think of them as big, cold Legos. **3. BUILD THE DOME** Mark out a ring 6 feet across and begin stacking blocks in an ascending spiral. Shave a slope into the top surface of each block so the wall curves inward as it rises. **4. OPEN IT UP** Cut a doorway. Poke a hole in the dome for air. To brighten up the joint, replace one block with pure ice—voilà, a picture window!



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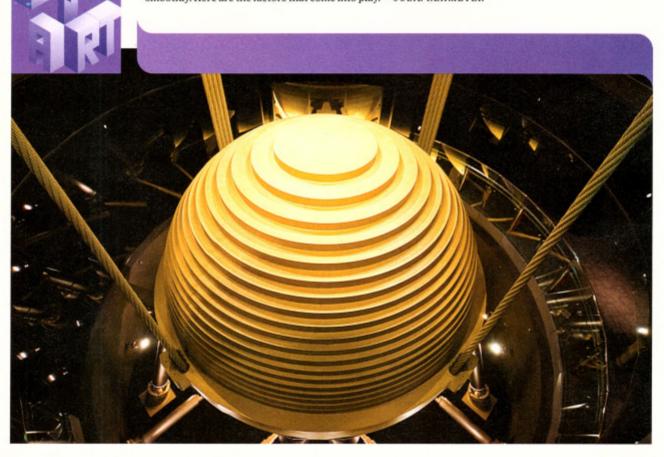
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than ever. The sport-injected 2011 Buick Regal. The New Class of World Class.

# Tuning a Skyscraper

A skyscraper is a giant tuning fork. Give one a good knock—like with an earthquake or a heavy gust of wind—and it'll start vibrating at its own natural resonance frequency (about seven octaves below the lowest notes on a piano). If you're on the top floor of, say, the 1,667-foottall Taipei 101, you could find yourself swaying back and forth abruptly, a total of up to 2 feet within five seconds. Highly barfogenic. So Taipei 101's designers hung a pendulum inside the building—in this case, they used an equation like the one below to determine that the

megastructure needed a 730-ton weight with giant shock absorbers bolted to its bottom. It's called a tuned mass damper, and when the tower starts to bend in the wind, the pendulum swings at the same frequency in the opposite direction, pulling the building upright and damping vibrations. It still sways, but subtly and smoothly. Here are the factors that come into play. —JULIE REHMEYER



FORMULA FOR ANALYZING STRUCTURAL SWAY

# $\ddot{u} = \frac{p - ku - c\dot{u}}{m}$

C Damping (kg/s). This is the key variable. The goal is to halve acceleration, and more mass—building plus pendulum—means more damping. Velocity of a swaying building at the top, in meters per second.

- Acceleration (m/s²) at the top of a building—the main cause of nausea. It's the derivative of velocity (û), which is the derivative of distance (u).
- The force applied to a structure by wind or an earthquake, measured in newtons (kg·m/s²).
- k Stiffness of a building, measured in newtons per meter (kg/s²)—the amount of force necessary to bend it a meter.
- U Displacement of a building at the top—that is, the distance it sways, in meters.
- The dynamic mass of a building, in kilograms. The top of the structure will move more than the bottom, so the upper mass counts more.



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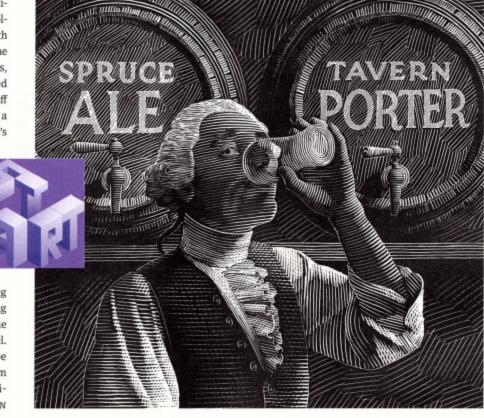
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# Retrobeer Philadelphia brewers reverse-engineer the ales that got the Founding Fathers drunk.

In 1757, a colonel in the Virginia militia recorded the way that thirsty soldiers had made a DIY beverage with some water, hops, and molasses. The colonel: George Washington. Yes, the father of our country recorded instructions for making a very stiff beer. God bless America! Today, a mile and a half from Philadelphia's

Independence Hall, Yards Brewing Company has resurrected old George's directions. It's one of the brews in its Ales of the Revolution series, an homage to a time when our forefathers were creating a

more perfect union—while getting drunk off their ass. But re-creating centuries-old formulas takes some detective work. And a liver of steel. "The beers back then tended to be very strong," Yards founder Tom Kehoe says. Here's how the recipes were revived. -MIKE OLSON



#### General Washington's Tavern Porter

Kehoe found Washington's formula for this brew favored by Colonial troops at the New York Public Library. "They'd drink half of a cask of porter, then add warm molasses and water steeped with bran oats," he says. "In a few days, it's carbonated beer." Yards uses a similar method-minus the drinking, of course.

#### Poor Richard's Tavern Spruce Ale

Based on Ben Franklin's recipe for sprucebased beer, which Kehoe found a copy of at a museum. It was great for warding off scurvyspruce is high in vitamin C-but it tastes terrible. To get the smell of Christmas without the taste of Pine-Sol. Yards steeps spruce and needles in the kettle late in the boil.

#### Thomas Jefferson's Tavern Ale

Kehoe studied the excavations of Jefferson's beer cellar and pored over his farm records to reverse-engineer a fruity barley wine with a bracing 8 percent alcohol by volume. But Jefferson would scoff: His version was almost 13. The cofounder of the Democratic-Republican Party was a party animal.



At microcontracting site Fiverr, it's all about the Abrahams.

Some services aren't worth minimum wage. Like writing this article's headline across your cleavage, or painting it on your forehead, or scratching it in the sand. Luckily, one site allows the underemployed and overly bored to peddle their skills at an appropri-

ately low rate. At Fiverr, a standard \$5 fee connects buyers to laborers and self-proclaimed experts in a dizzying variety of fields. Want to learn how to make your own lip balm? All you need is a PayPal account. Here's what we found in a cursory perusal of the site. We're sure that if we paid someone \$5 to dig deeper, they'd find even more. -M.O.

KAYLA\_20 will write a message across her cleavage. (1)

KMORTENSEN WILL write a slogan on her forehead and wear it to school. (2)

TIFFANYSTAR will scrawl out something on a beach in San Diego. (3)

MILKYWAYBAR WILL sing "Happy Birthday" as the Muppets Swedish Chef.

KAMIMATSU will do a serious dramatic reading of truly

horrible fanfiction. BOBINALASKA will get a tattoo of your choosing.

DIAPH will tell you 140 things you didn't know about cats.

MANDAMAMABEAR will call your grandma and try to explain how to use the cable box KLEDOO will plan your vacation to Slovenia.

HOLLYWOODWRITER will fake a love letter from any celebrity. TAMPAGUY will spare

the life of a chicken on his farm.

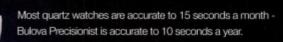




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DESIGNED TO BE NOTICED

# CLIVE THOMPSON We're All Coders Now

Writing software shouldn't be just for engineers—it can be as easy as ABC.



HOW DO YOU STOP people from texting while driving? Last spring, Daniel Finnegan had an idea. He realized that one of the reasons people type messages while they're in

the car is that they don't want to be rude—they want to respond quickly so friends don't think they're being ignored. I So what if the phone knew you were driving-and responded on its own? I Normally, Finnegan wouldn't have been able to do anything with his insight. He was a creativewriting major at the University of San Francisco, not a programmer. But he'd enrolled in a class where students were learning to use Google's App Inventor, a tool that makes it pretty easy to hack together simple applications for Android phones by fitting bits of code together like Lego bricks. Trinnegan set to work, and within a month he'd created an app called No Text While Driving. When you get into your car, you hit a button on the app and it autoresponds to incoming texts with "I'm driving right now, I'll contact you shortly." I've used the app, and it's terrific: By getting you off the hook socially, it makes your driving safer. It ought to be available—mandatory, even—on every phone. ¶ Finnegan's story illustrates a powerful point: It's time for computer programming to be democratized. Software, after all, affects almost everything we do. Pick any major problem—global warming, health care, or, in Finnegan's case, highway safety-and clever software is part of the solution. Yet only a tiny chunk of people ever consider learning to write code, which means we're not tapping the creativity of a big chunk of society. 9 Serious leaders already know this. "Every time I talk to generals in the military, they talk about how they can't find enough young people who know how to program," says Douglas Rushkoff, author of Program or Be Programmed, a new book that argues

that everyday people should learn to code.

What's more, knowing programming changes your worldview. "You learn that every problem is made up of smaller problems," says Kevin Lawver, a web designer whose 11-year-old son, Max, has spent the past few years designing programs using kid-friendly languages like Scratch. Frankly, companies like Facebook and Google would probably face a lot tougher scrutiny if their users understood how software works. Facebook users would know it's not that hard to program finely grained controls over who sees what on Facebook (a service that is, as computer scientist Eben Moglen semijokingly puts it, just "some PHP doodads"). The current mystique around software allows companies to claim that the way they're doing things is the only way possible, when it isn't.

But isn't programming inherently hard? Sure. So are lots of things. Hell, cooking dinner involves lethal implements, a fire inside your house, and ingredients (like raw chicken) that can poison you if they're not correctly prepared. We teach kids how to do that safely; we can do the same with programming.

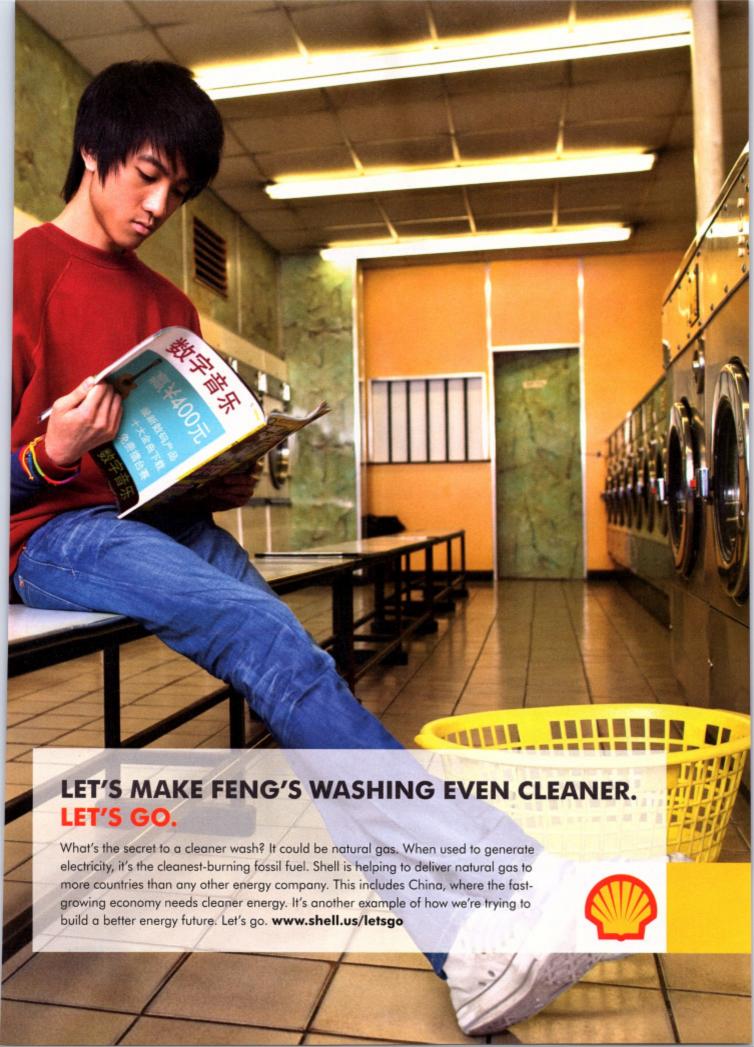
It'd be great if programming became part of the curriculum, but that probably won't

happen, given how slowly schools change. The good news is that—much as the "maker" set is relearning how to build stuff—a grassroots movement is creating tools that let even liberal arts majors hack together a program. In recent years, we've seen the release of oodles of languages designed to make it easy for kids (or adults!) to write code, from Processing to Scratch to Google's App Inventor. In fact, I just used App Inventor to make a program that lets my toddler and kindergartner call family members by touching their pictures.

Got a problem you need to solve? When you can program it yourself, there's always an app for that.

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TURN ON TOMORROW

# IMPLANTED IDEAS 11% PROPHETIC VISIONS .....p. 72 THE ELEVATOR PITCH .... p. 98 THE MOUIE 31% SHERLOCK JR. CHRISTOPHER NOLAN DISSECTING INCEPTION ..... p. 94 BABIES 11% STROLLERS GENETIC FA TRANSFORMATIONS 22% MALIGNANCIES ... BLACK SWAN .... р. 86 MOVIE TRAILERS .....p. 86 BOTANY ..... FAME ... VOYEURISM . p. 82 MICKEY MOUSE ... PENROSE STAIRCASE .... **BEGINNINGS** 19% SUPERHEROES ......p. 74

THEME FOR DECEMBER 2010

**INCEPTION** 

Acts of birth, evolution, inspiration, and illumination we cover this month. (Including a few stories about the movie.)

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INSPIRATION

#### Sleeper Hits (and Misses)

Everyone says we should follow our dreams. But is that always good advice? (Probably not if you live on Elm Street.) Here's a look at how some prophetic visions panned out.

THE DREAM Rolling Stone Keith Richards hears what will eventually be the "Satisfaction" riff in his sleep. RESULT The 10-note lick becomes an icon of youthful rebellion. Then it is used to sell Snickers bars.

THE DREAM Santiago the Shepherd, protagonist of Paolo Coelho's The Alchemist, sees treasure buried beneath Egypt's pyramids. RESULT He finds the loot and learns how to turn himself into wind along the way. Badass!

THE DREAM Elm Street resident Nancy Thompson meets disfigured gardener Freddy Krueger, who attacks sleepers with finger knives. RESULT At least 10 sequels and spinoffs. Call it a recurring nightmare.

THE DREAM Twin Peaks FBI agent Dale Cooper speaks with a backward-talking, murdered prom queen. RESULT Cooper identifies the murderer and destroys everything interesting about Twin Peaks.



TEXT Megan Geuss

ILLUSTRATION Pete Ryan



PLRY // INCEPTION // PROTOTYPE //

BLASTS FROM THE PAST

# Sherlock Jr.

More than 80 years before *Inception*, Buster Keaton's dreamy silent movie mesmerized audiences.

MOVIE THAT MARSHALS eve-



popping special effects, precision editing, sophisticated action choreography, and diabolically elaborate sets to explore the nexus between dreams and reality. Sounds familiar, right? Well, it's not Inception-it's the 1924 silent comedy Sherlock Jr., directed by Buster Keaton. 9 On the surface, Sherlock Jr. is a typical Walter Mitty tale: A hapless movie projectionist, framed by a romantic rival for a theft he didn't commit, fantasizes about becoming a detective and clearing his name. The film is filled with Keaton's signature acrobatic stunts and delightful visual wit, but things really get interesting when the projectionist falls asleep while screening a drawing-room mystery. Dreaming that the movie characters are his sweetheart and the rival, his dream-

self rises, walks up the aisle, and climbs into the screen to confront them. (To achieve this effect, Keaton built a carefully lit set within a set.) ¶ The dream reality tries to expel the interloperfirst, his nemesis tosses him back into the audience. (As he lands, we see the snoozing projectionist twitch.) When he clambers back into the screen, the film medium itself appears to shake him loose by abruptly cutting scenes out from under him: The drawing room becomes the front stairs, shutting him out of the house. As he descends, the steps become a garden bench, causing him to take a nosedive. Dusting himself off and sitting down, he lands on his keister in a busy street. And so on-diving off a wave-battered rock, he lands in a snowbank. By precisely matching posture and camera angle from scene to scene, Keaton made it look like reality was shifting around him. 9 Half a century before Christopher Nolan was born, and long before CGI, Keaton created a vivid world with its

> own laws and internally consistent logic. Call it the inception of *Inception*—it probably left just as many folks scratching their heads on the way out.

To watch a clip of Sherlock Jr., download WIRED from the iTunes Store.

iPad Extra

TWICE MELLOWED.
ONCE GIFTED.



Jack Darried

STRAIC FROM THE MAKERS OF 7500



MODERATION IS ALWAYS IN SEASON. PLEASE DRINK RESPONSIBLY.

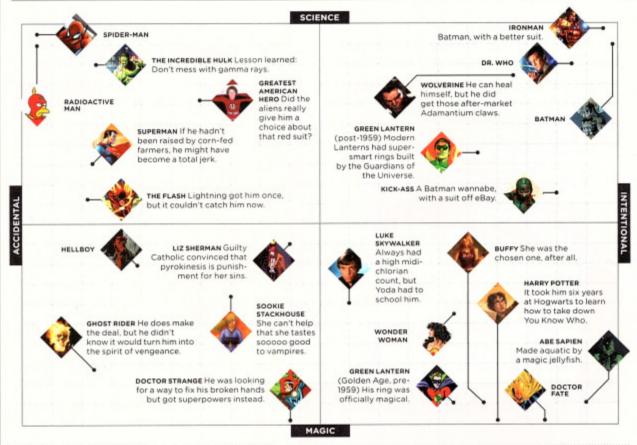
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THE MATRIX

# **Origin Stories**

Some heroes are born; others are selfmade mechamen. Here's a guide to how our favorite supers got that way.





TEXT Justin McLachlan

ASK AN ALGORITHM

#### Sell Yourself



#### // RECOMMENDATION ENGINE // .

I've just started a band. How do I coax people to check out our music?

Syllabus for Marketing 101 at Berklee College of Music references "social media," "niche markets," and "gain attention first; money will follow." Positively reviewed attention-management and online-publishing tools include Band Metrics (fan-statistics tracking), Facebook/MySpace (song streaming/networking), YouTube (videostreaming), and Twitter (short-form text/link broadcasting). Data indicate music consumers who use Twitter buy 77 percent more music downloads than non-

Twitter users. Similarities between the current most-followed, best-selling artists with staying power (Lady Gaga + Justin Bieber) include genre (pop/dance), instruments played (vocals, piano), age (<25), and inclusion (or rumored inclusion) in the television series Glee. Also detecting statistically significant references to androgyny. RECOMMENDATION: Establish androgynous aesthetic. Write songs. Shoot video. Post material online. Amass Twitter followers. Release album. Book shows. Retweet rumors about hermaphroditism and/or sex change.

0 7 4

SYSADMIN Steven Leckart

ILLUSTRATION Pete Ryan



# SHOWTIME HOUSE

Top designers and architects transform three New York penthouses into the ultimate designmeets-technology multimedia showhouse—inspired by seven original Showtime series: The Big C, Californication, Dexter, Nurse Jackie, United States of Tara and Weeds, plus soon-to-be-launched The Borgias.

#### THE BORGIAS: Media Room

#### DESIGNERS: Marc Thorpe and Hush Studios, Inc.

Inspired by the Renaissance era setting of *The Borgias* and the rise of a powerful pope, this room combines neon light with interactive technology, transforming classic icons into a modernist sculpture that emits sound and motion. Featuring: Lutron lighting: PANTONE Paints by Fine Paints of Europe.

All photographs by Andrew French
Showhome production and photo styling by Chrysanthemum
Partners with IPD Partners, Carol VanderKloot and Carla Jordan

LOCATION: Cassa Hotel and Residences, 70 W. 45th St. www.cassahotelny.com





#### THE BIG C

#### 1: Clarity Lounge

> Designer: BG Studio International Inc. The Big C treats the diagnosis of cancer as a catalyst for change for lead character Cathy. The Clarity Lounge offers a whimsical take on a living room designed around the themes of rejuvenation and birth with a swinging sofa, Swarovski's Blossom chandelier, a living wall of plants and a Magnetic 3D TV showing healing scenes of nature. Featuring: Blossom by Tord Boontje and Glitterbox Floorlamps/Lanterns by Georg Baldele for Swarovski Crystal Palace; Karastan custom rug; Lutron lighting; PANTONE Paints by Fine Paints of Europe.

#### 2: Master Bedroom/Bath

#### > Designers: Stephen Chung with Matthias Altwicker/AB Architekten

The secret behind Cathy's tranquil retreat is an interactive chromotherapy system that uses color to evoke a sense of emotions by using hue-changing LED lights concealed behind the walls and ceiling. Featuring: Dyson Air Multiplier Fan; Hastens Excel II bed; Karastan rug; Lutron lighting; PANTONE Paints by Fine Paints of Europe.



#### THE BORGIAS: Great Room

#### > Designer: Keith Baltimore

This great room made in honor of *The Borgias* has the feel of a basilica church in Renaissance Italy but with a modern twist—a gaming station plays *Assassin's Creed*. Featuring: Brizo fittings; IDS Audio/Video Technologies; Lutron lighting; PANTONE Paints by Fine Paints of Europe; Swarovski Crystal Cross.



#### UNITED STATES OF TARA: Loft

#### > Designers: Brooks Atwood of Pod Design + Media/NJIT Assistant Professor, with Perlin Studios

When stepping into this enormous exoskeleton, visitors enter the many-layered and subconscious mind of Tara. Video tracking technology created a digital mirror allowing visitors to merge their identities with one of Tara's alternate personalities from *United States of Tara*. Featuring: Dyson Air Multiplier Fan; Lutron lighting; PANTONE Paints by Fine Paints of Europe.

#### WEEDS

#### 1: Lounge

> Designers: John Loecke and Jason Oliver Nixon of John Loecke Inc.

Nothing in the world of Weeds is black and white, so why shouldn't the Botwins' lounge follow suit? Although the vivid floral wallpaper looks like pricey designer fare, it was custom-made with HP's Wall Skins, a system that uses digital technology to convert any design into an affordable wall covering. Featuring: Dyson Air Multiplier Fan; Brizo fittings; Lutron lighting.

#### 2: Loft

> Designers: Robert Bristow and Pilar Proffitt of Poesis

The Weeds loft combines beautiful custom-made furnishings to impart the uncomfortable, paranoid feeling of Nancy Botwin's life on the run. Featuring: Brizo fittings; Lutron lighting/shades; PANTONE Paints by Fine Paints of Europe; Sonos S5 all-digital sound system.







#### CALIFORNICATION

#### 1: A State of Mind

> Designer: Space 4 Architecture (Michele Busiri-Vici, Guelfo Carpegna, Ulderico Micara)

Hank Moody's troubled state of mind and the feeling of balancing on the precipice are captured in this room through mirrored flooring, transparent and prickly furniture and a dark, slanted entryway. Featuring: Lutron lighting; PANTONE Paints by Fine Paints of Europe.

#### 2: Lounge

 Designer: ECCO Design (Eric Chan, Bradley Price, Jeff Miller, Peng Zhao)

Hank's lounge is filled with reminders that in Hollywood all is smoke and mirrors. There are smoky photos on the closet doors and a wall covered in fractured glass. The immersive photo booth uses HP technology to put visitors into the shoes of their favorite Californication character. Featuring: Brizo faucet and fittings; Dyson Air Multiplier Fan/Vacuum; Lutron lighting/shades; PANTONE Paints by Fine Paints of Europe.







#### DEXTER

#### 1: Refuge

> Designer: Jeff Andrews of Jeff Andrews-Design
If Dexter could live his life openly, he'd be drawn to
this moody refuge that appeals to his artistic and
intellectual sides, as well as his fragmented personality. Elements of this room are organic, fractured
and creepy, but the technology is nothing but the
latest from LG: superthin LG LED TV and LG's
Art Cool. Featuring: Dyson Air Multiplier Fan;
Brizo fittings; Lutron lighting; PANTONE Paints

# by Fine Paints of Europe. 2: Gaming Room

#### > Designer: Gregory Okshteyn of Studios Go

Modeled after the animation software used to create the Dexter the Game iPhone app, the 10-by-12-foot loveseat was made from 1,100 laser-cut board pieces and took four weeks to create. The mirror behind it transformed into sound speakers using Sensorium AV's new transducer, a three-inch-diameter disc placed on the mirror backs. Featuring: Karastan rug; PANTONE Paints by Fine Paints of Europe.





#### NURSE JACKIE

#### 1: Master Bedroom

#### > Designer: Laura Bohn of Laura Bohn Design Associates

Nurse Jackie's patients will recoup in a whimsical room filled with clever yet hallucinating takes on perspective, form and light. Centered around a trapezoidal bed, the latex draperies, light sculpture, heart monitor accents and chapel provide an innovative twist on conventional Nurse Jackie hospital fare. Featuring: Dyson Air Multiplier Fan; Lutron lighting; PANTONE Paints by Fine Paints of Europe.

#### 2: Lounge

#### > Designer: Katie Lydon Interiors

Swirling around Nurse Jackie like a haute hallucination are walls evoking all things medical. In her lounge, walls are embellished with an all over pattern of pills, pill bottles, syringes and thermometers, each hand-stenciled in silver metallic and scarlet paint. Featuring: Dyson Air Multiplier Fan; Brizo fittings; Lutron lighting; PANTONE Paints by Fine Paints of Europe.



# GET AN INSIDER'S VIEW OF THE SHOWTIME HOUSE

#### 1: Hallway

#### Designer: Bruce Mau Design

An iconic symbol from each series, like this knife from Dexter, was projected on the walls, painted to appear slightly skewed and then set against a backdrop of eye-popping colors. The spaces offer clues to the inner workings of each character, reminding us that when it comes to inner complexities, nothing is as simple as black and white. Featuring: PANTONE Paints by Fine Paints of Europe.

#### 2: The Borgias' Great Room 3: The Big C's Master Bath

The latest products from Brizo (in The Borgias' great room) and Dyson (in The Big C's master bath) appear throughout the showhouse and are perfect complements to the designers' visions.

To learn more, visit showtimehouse.com.











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TECHNOLOGY PARTNERS



























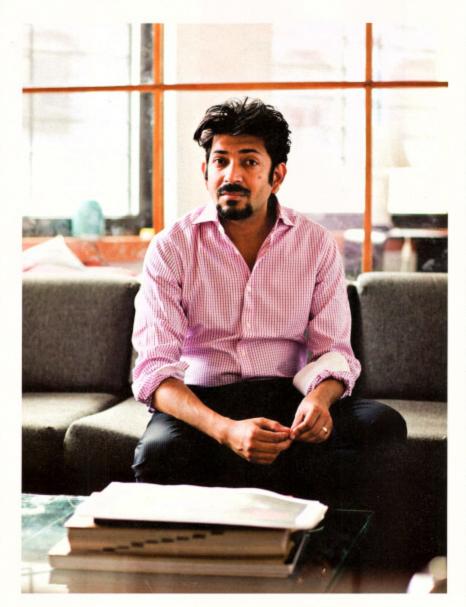




Q&A: SIDDHARTHA MUKHERJEE

## Our Cancer, Ourselves

How the story of one disease is really the story of medicine.



T BEGINS WITH a single mutation deep inside a cell. It ends, too often, with a takeover of the body: cancer. In his poignant debut, The Emperor of All Maladies, Columbia Medical School leukemia expert Siddhartha Mukherjee delivers a "biography" of
cancer, showing how our conception of the disease has changed with our understanding of the body. Ancient Romans blamed an excess of "black bile." At the dawn of modern surgery,
physicians relied on procedures like radical mastectomies. The atomic age birthed supertoxic
chemo cocktails. And now that we're plumbing the mysteries of the genome, we aim to crack
the codes that hijack our cells. "Every era," Mukherjee writes, "casts illness in its own image."

One of the recurring motifs in your book is that cancer is like an exaggerated version of ourselves-a caricature of our own cells' imperatives for growth and evolution. Nearly every one of the genes that turns out to be a key player in cancer has a vital role in the normal physiology of an organism. The genes that enable our brains and blood cells to develop are implicated in cancer. The gene that enables birds to learn songs can become cancer-causing. There is no normal physiological process that can't be bastardized by the disease.

How have genomics research and personalized medicine changed the way we think about cancer? In the book, I paraphrase Tolstoy and say that normal cells are identically happy, but cancer cells are unhappy in their own unique ways. If you take 100 breast-cancer samples, 100 types of cancer have 100 different hallmarks of mutated genes. You could be nihilistic and say, "Oh, God, we'll never be able to tackle this!" But there are deep, systematic, organizational principles at work in all that diversity. The most promising direction in cancer R&D is to understand those principles at the genetic level.

You call your book a biography of cancer. How do you visualize the lead character in the story? Because I work on leukemia, the image of cancer I carry in my mind is that of blood. I imagine that doctors who work on breast cancer or pancreatic cancer have very different visualizations. About a month ago, I changed the color of the crab on the cover of my book from black to red to match my image of the disease.

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CANDID CAMERA

## Indecent Exposures

A new exhibit explores how photographic innovations enabled intrusion.





OR SANDRA PHILLIPS, it all started with a 1997 exhibit of police department photos—including some of the earliest images of crime scenes, mug shots, and evidence—at the San Francisco Museum of Modern Art. The longtime photography curator at SFMOMA was hooked and has been acquiring invasive photographic firsts ever since. Especially intriguing to her was a salacious side project by impressionist Edgar Degas, one of the first major artists to use the camera as a tool for voyeurism. Those photographs, Phillips says, "look like peep-show pictures of people doing things like getting dressed or drying themselves." Phillips found other snapped breaches of privacy by digging through the National Archives and private collections. The resulting exhibit, Exposed: Voyeurism, Surveillance and the Camera Since 1870, is on display at the museum through April. It chronicles the history of photographic intrusion, from hidden cameras to celebrity stalking and recorded violence. Here's a peek at a few first exposures.

Untitled, Kohei Yoshiyuki (1971) The advent of infrared-sensitive film and filtered flashbulbs let Yoshiyuki photograph sex acts clandestinely in Tokyo parks. For this series, called The Park, he documented not only the prurient activities but also the voyeurs who lurked in the shadows.

A "Scrub" and Her Bed the Plank, Jacob Riis (1892) A police reporter turned social reformer, Riis charged into the tenements of lower Manhattan to capture unsuspecting denizens at night. He used a magnesium- and gunpowder-filled pistol as a flash to expose society's "other half." The subjects were often asleep, intoxicated, or too tired to consent.

The Electrocution of Ruth Snyder, Tom Howard (1928) To get this New York Daily News shot, the first-ever published photograph of an execution, Howard planted one camera on his chest for confiscation and strapped another to his calf. Snyder had murdered her husband with the help of her lover; Howard caught her death by raising his pant leg and pulling a cable threaded up to his pocket.







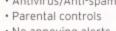


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NOTHING

CLOSE

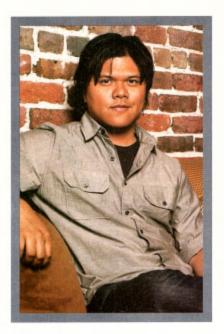


TITANIUM

MAXIMUM SECURITY 2011

# Ones to Watch

Get ahead of the pack with must-have, tech-inspired trends from Bernard Antolin, the founder of AcquireMag online.



For Bernard's full trend report and to view a day in his life, visit FordOnesToWatch.com.

While you're there, enter for a chance to win the Ford Ones to Watch sweepstakes.



Drive one.

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#### **FASHIONABLY TECHNICAL**

Your winter jacket shouldn't make you look like you're trying to find your Sherpa. New high-tech fabrics allow brands like **Aether** to create jackets that keep you warm without the bulk.

# THE RETURN OF THE INSTANT PHOTO

There's a certain charm about instant pictures that digital can never replicate. Analog purists are happy to know that companies like The Impossible Project are pushing for an instant-photo renaissance by releasing their own special films and limited-edition cameras that keep the instant-film flame burning.

#### **EAR CANDY**

Whether you like your gear shiny and flashy or you're a design-savvy minimalist, you can choose headphones in variations and colors for any taste or mood, like these from **Urbanears**.

#### SUSTAINABLE TECH

You can now get an iPad or iPhone case made of a sustainable material like bamboo. Green audio company **Vers** uses nothing but sustainable wood, which lends an eco-smart edge to high-tech gadgets.

#### THE NEW CARRY-ON

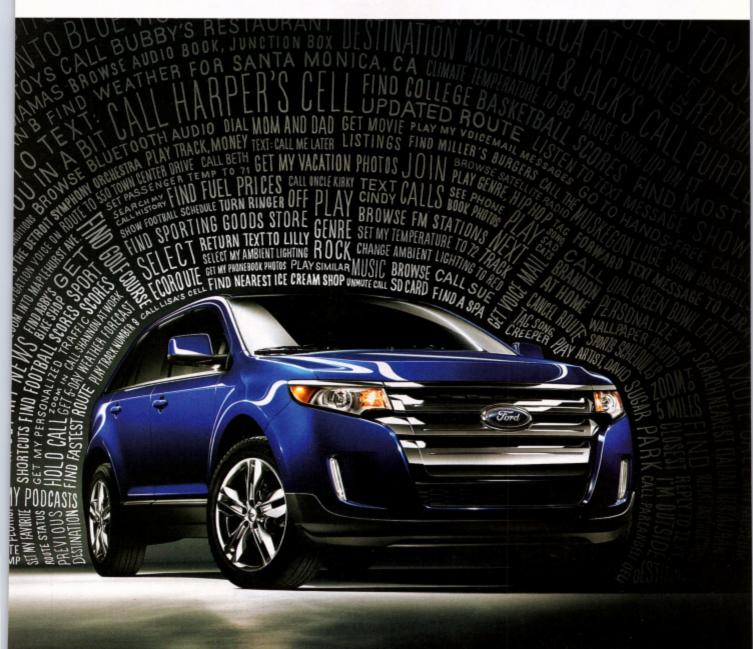
Streamline your travel with one of my favorite carry-alls, the Messenger Backpack from Incase with room for a couple of days' worth of clothes and an easily accessible laptop slot that makes TSA screenings a breeze.

#### FORD EDGE -

One of this season's most tech-forward trends is the 2011 Ford Edge with available MyFord Touch™ technology. Through 10,000 recognized voice-activated controls, LCD instrument displays, steering-wheel control panels and an intuitive touch screen, drivers can direct their navigation, entertainment and phone all by the sound of their voice or the touch of a finger.







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Drive one.

DANCER IN THE DARK

# Grim Fairy Tale

Director Darren Aronofsky transforms Swan Lake into a macabre thriller.





here are movie creatures we expect to be scary, like vampires, zombies, or Zach Galifianakis without his pants. But when Darren Aronofsky set out to invent a new kind of psychological thriller, he began with cherry-cheeked ballerinas in toe shoes. Aronofsky has shown us the dark side of the everyday before, in Requiem for a Dream and The Wrestler. Now, in Black Swan, he brings out the evil in the cloistered world of the New York City Ballet. The movie stars Natalie Portman as a mentally deranged dancer so obsessed with her starring role in Swan Lake



that she begins an excruciating physical transformation into a black-feathered beast. "Swan Lake is about a young woman turned into a halfswan, half-human creature by an evil magician. When I heard that, I realized, oh wow-this is a werewolf story," Aronofsky says. "I started thinking about Natalie Portman and the idea of turning her into a swan, and I thought, it's gonna be gruesome." Tchaikovsky's sweeping symphonics accompany American Werewolfesque morphing sequences (there are 300 f/x shots in the film-impressive for a modestly budgeted indie), making Black Swan the world's first surrealist-horror-thriller-scifi-ballet movie. Or something like that, "Alec Baldwin described it as Jacob's Ladder in tutus," Aronofsky says, laughing, "And I'm not about to disagree with Alec Baldwin." Indeed. To the list of things that terrify us, add 90-pound divas.

TEXT Nancy Miller

FIRST LOOK

#### The Trailer Track

MOVIES DON'T START with the opening scene; they start with the trailer. And buzz surrounding this alpha piece of promotion can make the difference between a blockbuster and a straight-to-DVD bust. Benedict Coulter, founder of top editing house Trailer Park, reveals a few industry secrets.

086

TEXT Allison Davis

#### Top Gun was the Citizen Kane of trailers:

of trailers: Those two minutes of quick cutaways and hair-gelsmooth action clips were the best of the best.

#### Trailers are their own franchise: Flicks like Avatar have at least two sets of teasers (online and in-theater) and up to four different trailers

in rotation.

There's an industry standard: MPAA dictates that no trailer can run more than two and a half minutes. Most make use of all that precious time.

Trailers are expensive: They generally cost \$350 to \$2,500 per second to produce—sometimes far more once you factor in music and market testing.

// PREUIEWS // .



# ONE BRILLIANT IDEA DESERVES ANOTHER.

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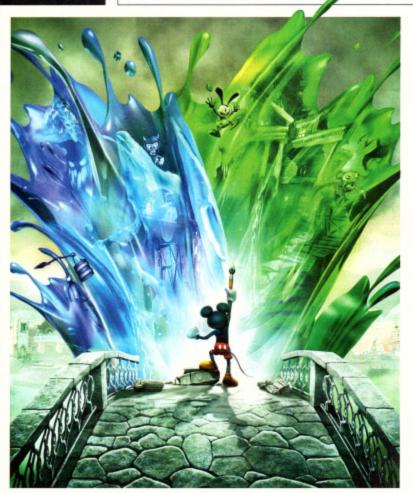
GOONEYTOONS

# Danger Mouse

A new game harks back to Mickey's bad-boy roots.



MICKEY MOUSE WASN'T ALWAYS a squeaky-clean do-gooder in white gloves. Frankly, when he debuted in 1928, he was kind of an asshole. He guzzled beer, forced smooches on Minnie, and swung a cat around by its tail just to hear it yowl. But within a year, he settled down to become the upstanding fellow we know today, "Mickey quickly went from anarchist to young adult," says Warren Spector, lead developer on the new game Epic Mickey. Out November 30, the game attempts to capture both sides of the seminal animated rodent. 9 Spector, who is adored by hardcore gamers for creating the dark cyberpunk franchise Deus Ex, may seem like an odd choice to helm a Disney game (for the kid-friendly Wii console, no less). "But I wasn't always a trenchcoat-and-sunglasses kind of guy," he says. "I used to be an animation junkie." He wrote his master's thesis on Looney Tunes characters and created a tabletop role-playing game based on the crazy physics of cartoons. Now he's using his encyclopedic knowledge of animation history to take Disney's flagship character back to his roots. ¶ In Epic Mickey, players control the titular mouse as he fights his way through a freaky underworld inhabited by forgotten Disney characters like Oswald the Lucky Rabbit, a Mickey precursor from the silent era, and the Gremlins, stars of a scrapped 1940s feature. Instead of standard videogame weapons, Mickey is armed with ink and paint thinner. He can choose to behave like the good guy of his mature years or the mischievous scamp of his



#### // DECODE // 0

DO THIS PUZZLE

#### Up the Down Staircase



SOLUTION wired.com/magazine/category/key/

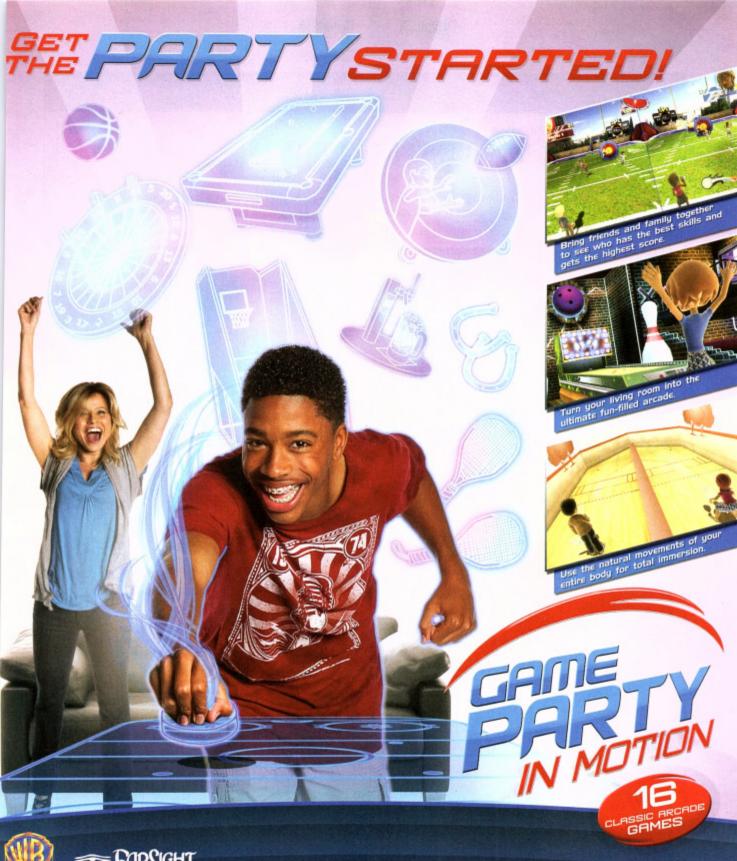
You're trapped in a dream featuring a Penrose staircase, the impossible architecture that characters grappled with in Inception. You start on the blue step. and you're allowed eight moves. On each one, you may travel either up or down. If you go up, you move a number of spaces equal to N-1, where N is the number on the step you began the move-6 at the start. If you go down, travel N+1 spaces. At the end of your move, you'll be on a step with another number. Again, move up or down the stairs following the same rules (N-1 or N+1). Each move must end on an unvisited step. Your goal is to finish where you began-on blue 6.

B B Issue December

PUZZLE Eric Harshbarger

TEXT David Kushner

youth. Our choice? Pucker up, Minnie.







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REQUIRES KINECT SENSOR





KINECT



SIFTING THROUGH THE OPTIONS

## SMART STROLLERS

A few months from now, that former twinkle in your eye will be a real squealer in need of some transportation. Here are a few swank tot toters.



- Inglesina Classica Pram
  PERFECT FOR: Steampunk
  enthusiasts GEEK FRCTOR:
  Most 21st-century strollers
  look like lawn chairs on
  wheels. But Inglesina's
  Victorian-inspired pram,
  complete with organza
  privacy curtain and leather
  handle, lets your little
  dandy cruise in Savile Row
  style PRICE: \$1,300
- Chariot Carrier CX1
  PERFECT FOR: Bike nerds
  GEEK FACTOR: Pedal pushers
  will dig how this rig converts
  from a front-facing stroller to
  a rear-riding bike trailer. Drum
  brakes, handlebar bag-cumbackpack, and Scotchlite
  reflective strips that light up
  the night make it the perfect
  roadie. PRICE: \$850 (\$70
  and up for conversion kits)
- Stokke Xplory
  PERFECT FOR: Ergonomics
  freaks GEEK FACTOR: This ride
  offers five positions for baby
  —from reclined and sleeping
  to upright and peeping—and
  adjusts as your adorable new
  born grows into a monstrous
  toddler. Plus, the seat slides
  up and down to keep Mr.
  Dribbles at ideal.chin-wiping
  height. PRICE: \$1,000
  - Bugaboo Cameleon
    PERFECT FOR: Breeding
    fashionistas GEEK FACTOR:
    Spawning doesn't mean
    you have to surrender your
    skinny jeans. With 36 color
    combinations to choose
    from, this ride kicks high
    style at the swing set. Plus,
    you're sure to find something that will match your
    Keds. PRICE: \$880 and up

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PLAY // INCEPTION // SCREEN //

Q&A: CHRISTOPHER NOLAN

# Dream Weaver

The writer-director of *Inception* gives away everything. Or does he?





CHRISTOPHER NOLAN, director of Memento, and The Dark Knight, tends to let his twisty genre deconstructions speak for themselves. But he agreed to talk to WIRED about the decade-long inception of his movie Inception (on DVD December 7). We talked to him about heists. architecture, and the difference between ambiguity and a lack of answers. Hint: One is better (looking at you, Lost). For a Nolan-aided breakdown of the film, turn the page.

How hard was it to write the Inception script? The real problem was that I started with a heist film structure. That seemed the best way of getting all the exposition in. What I eventually realized, however, is that heist films are usually unemotional. But I wanted to deal with the world of dreams, and I realized that I really had to offer the audience a more emotional narrative. Tell me about the importance of architecture in the movie. The only job that was ever of interest to me other than filmmaking was architecture. And I'm very interested in the similarities between the way we experience a threedimensional space that an architect has created and the way an audience experiences a cinematic narrative that constructs a threedimensional reality from a

two-dimensional medium. Have you read the online discussions of the film? I've seen some of them, yeah. Do people get it? People seem to be noticing the things they're meant to notice, the things that are meant to either create ambiguities or push you in one direction or another. But I've also read plenty of very offthe-wall interpretations. OK, but seriously: Is it all a dream, or what? It's very important to me that by the end of the film you under-

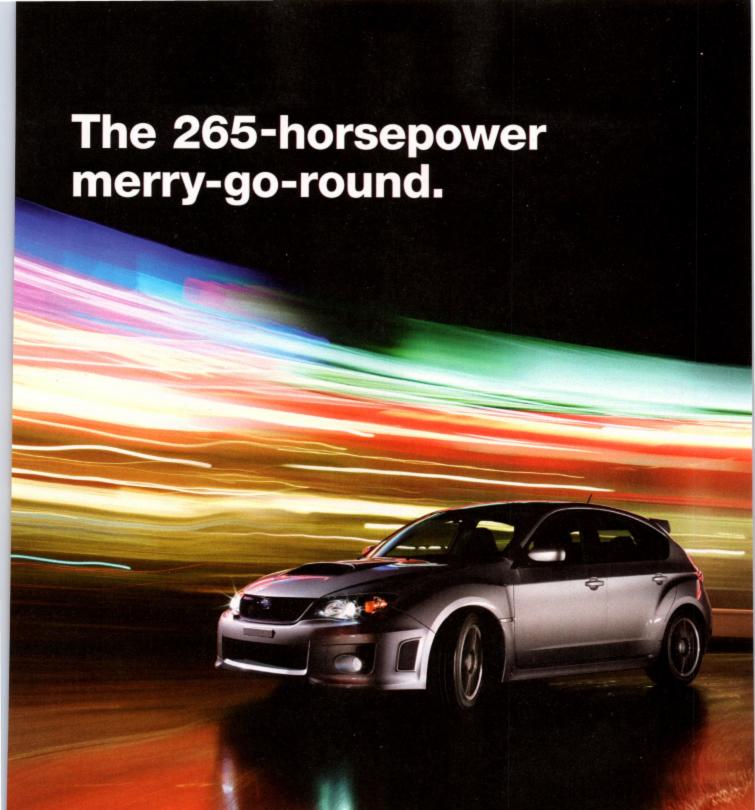
important to me that by the end of the film you understand what Mal means when she says to Cobb, "You don't believe in one reality anymore," and that we see the potential for getting lost. How did you read the end of the film yourself?

I choose to believe that Cobb gets back to his kids, because I have young kids. People who have kids definitely read it differently than those who don't. Clearly the audience brings a lot to it. The most important emotional thing about the top spinning at the end is that Cobb is not looking at it. He doesn't care.

I'd guess there's no one right answer. Oh no, I've got an answer.

You do?! Yeah. I've always believed that if you make a film with ambiguity, it needs to be based on a true interpretation. If it's not, then it will contradict itself, or it will be somehow insubstantial and end up making the audience feel cheated. Ambiguity has to come from the inability of the character to know—and the alignment of the audience with that character.

TEXT Robert Capps



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WRX: Well-equipped at \$25,495

# Inception, Explained

Christopher Nolan helps us interpret his mind-bending film.

Cobb wakes up on a beach. After the first extraction fails, Cobb spins his top to check if he is in a dream. It falls over.

Saito says he'll clear Cobb's name if he takes the job. He asks Cobb to take "a leap of faith." Cobb needs a new architect. His father-in-law. Miles, introduces him to Ariadne.

Cobb starts assembling his team and trains Ariadne in dreamweaving.

Cobb goes to Mombasa to get Eames the forger and Yusuf the chemist.







THE ENDING IS NOT A DREAM.

Saito spins the top, and it spins forever-we can separate dreams from reality.

This establishes context for the audience-the movie is not all a dream

Filmmaker Nolan is asking the audience to take a leap of faith that the movie is not a dream.

After a test dream ends badly, Cobb spins his top. It falls. Still not a dream.

THE ENTIRE MOVIEIS A DREAM.

As in The Tempest, Cobb wakes up in a new world.

This gives Cobb a baseline reality. But he's an untrustworthy narrator."

The phrase leap of faith occurs over and over. It's an artifact of Cobb's subconscious

Miles tells Cobb to "come back to reality"-a sign that he's living in a dream.

We never see how Cobb gets to Mombasa where men in suits try to kill him. It's a dream.

JUST THE **ENDINGIS** A DREAM.

OK, Cobb's not dreaming. But that doesn't mean he won't unknowingly enter a dream.

'I've never read Joseph Campbell. Some things were

"I don't think I'm going to tell you about this." Yusuf's assistant says that to a dreamer, the dream is reality. Reality is subjective.

THE MOVIE IS A HEROIC EPIC.

**MEDITATION ON** 

ARCHITECTURE.

A classic "call to adventure." Cobb initially refuses, then accepts.

In Greek mythology, Ariadne aided Theseus in defeating the Minotaur, She'll be Cobb's guide. I wanted to show the potential for the real world to have analogies to the dream world. The mazelike city of Mombasa does that."

on my mind-the labyrinth, the Minotaur, etc." OR MAYBE IT'S A

A beautiful pan across Tokyo rooftons.

A beautiful pan across Paris rooftops, Also, Miles says he has "no space to think."

Cobb tries to limit Ariadne's creativity in the dreamspace: no specific memories as templates.

A beautiful pan across rooftops of Mombasa.

ACTUALLY. IT'S ABOUT MOVIE-MAKING.

Movies ask us to take a leap of faith-to suspend disbelief.

'I didn't intend to make a film about filmmaking, but Igravitated toward the creative process that I know."

All the roles correspond. Cobb: director. Ariadne: writer. Eames: art director. Saito: producer. Fischer: audience.

Smash cuts, mysterious chases. implausible coincidences-the grammar of film is the grammar of dreams.

0 9 4

TEXT Robert Capps & Patrick Di Justo

ILLUSTRATIONS Luke Shuman

'I wouldn't say that I tried to use the grammar of the film to tell the audience what is dream and what is reality." CONSIDER US INCEPTED. Ever since Christopher Nolan's blockbuster hit theaters in July, we've been trying to suss out dream from reality. Now that we can bring the movie home, we can put our freeze-frame thumb to use. (Haven't seen the movie? Stop reading, This is one big spoiler.) Nolan specializes in puzzles, and Inception is no exception. The trick isn't the plot-come on, it wasn't that complicated. The challenge is picking out Nolan's lies. Does hero Dom Cobb's totem tell the truth about whether he's dreaming? Is the sequence in Mombasa just good action or good action in a paranoid dream? Below, our take on what's really going on. To make sure we haven't lost our minds, we let Nolan himself weigh in. As they say in Inception, the only way forward is downward—so into the rabbit hole we go.

The team enters dream level one-the city. Cobb recounts to Ariadne his history with Mal. The team enters dream level two, the hotel, and then dream level three, the hospital/fortress. After Fischer is killed in level three, Cobb and Ariadne chase him into limbo.

Cobb confronts Mal in limbo. and Fischer is incepted in the hospital.

Cobb washes up on the beach (full circle with beginning).

Arriving home, Cobb finally sees his children's faces.

Cobb spins the top-it's still spinning when the movie cuts to black.









The important thing is

that Cobb's not looking at

the top. He doesn't care."



Mal asks Cobb to "take a leap of faith" before her suicide. The line's reverberating in his subconscious

For the ambiguity at the end to work, you need to see that Cobb's world and the dream world are very similar. And you need to doubt Cobb."

Mal challenges Cobb's reality. Faceless corporations? Chased around the

globe? Really?

Uh ... that's not

how I would have

read the movie."

Saito honors his agreement. They build limbo to be their reality together.

> The film is about

architects.

It's about

builders."

Saito spins the top-and it keeps spinning. Dream.

"The kids are not wearing the same clothes at the end! And they do age! We were working with two sets of kids."

aged! And they're in the same clothes! This is clearly all a dream.

The kids haven't

Cobb and Saito created this world for this moment. The ending is a dream catharsis.

The top doesn't matter-Cobb can finally see his children's faces.

The top totters:

It's about to fall.

The top is going to spin forever. The ending is a dream.

OK, we have no

Cobb begins his descent to the underworld. It starts with "the road of trials."

Cobb spent some 50 years in limbo with Mal. Their world is an architectural mnemonic.

The architecture of the hotel is Arthur's weapon (walls, Penrose stairs, elevator).

Ariadne leads Cobb into the underworld. In heroic epics, this is "crossing the threshold."

Cobb and Mal's personal architecture includes building one kind of world inside the skin of another.

To see his kids again, Cobb vanquishes Mal -and his subconscious-by saying good-bye.

The destruction of limbo is an urban apocalypse of decaying skyscrapers.

The meaning of the movie (Cobb's defeat of Mal) has been given to the audience. We've been incepted.

The hero has succeeded in his quest. He sees his kids' faces. Catharsis is reached.

idea how the top finishes the hero's journey

The prop guys just made a top that would spin for a long time.

It's the golden-lit craftsman dream home ... with a house made of blocks on the dining table.

The top itself is constructedtopologically, it's a pseudosphere, every point curving away.

Oh no, I've got an answer ...'

The audience has to "take a leap of faith." Nolan uses ambiguity as a storytelling tool. There isn't just one answer.



WHY CAN'T HOLLYWOOD GET IT RIGHT?!

### Baby Formula



I'LL PLAY ALONG when Hollywood casts a 35-year-old woman as the mother of a 21-year-old (see The Sarah Connor Chronicles). It's biologically possible. But there's no excuse for the genetic fallacies in these baby-obsessed "rom-coms." Take The Switch, a movie in which blue-eyed Jennifer Aniston knocks herself up using the goods from blue-eyed Jason Bateman. Nine months later, out pops a brown-eyed baby. Are the filmmakers so arrested in their development that they didn't take biology? Even a high school sophomore can tell you that the chances of two blue-eyed phenotypes producing a brown-eyed phenotype are about as a slim as a Brangenifer three-way. Combine recessive alleles all you want-you can't make a dominant allele. Oh. and sending out preprinted invites for an "I'm getting pregnant!" party?! Ovulation is prompted by a surge of luteinizing hormone. While cyclical, there's no way to predict the exact day of optimal fertility. Which means throwing a bash for a specific egg-drop date is, ahem, inconceivable.

ILLUSTRATION Pete Ryan

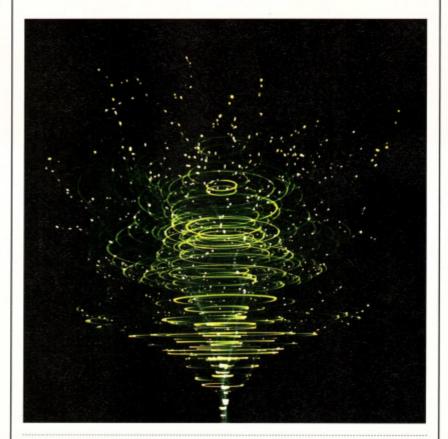
BOTANY

# **Branching Out**

Photographer Caleb Charland exposes plants when they're just getting started.



a magnet. A bud on a plant that's poised to grow into a branch. These moments of inception are often ephemeral to the point of being undetectable, but Caleb Charland manages to capture them, turning those flashes in the mind's eye into thought-provoking photographs. ¶ His latest endeavor (working title: Node Project) focuses on those points on a plant from which leaves and branches sprout. "Each of the little nodes—they just felt like they could be an armature for an image," he says. To create the effect shown here, Charland spray-painted a shrub black, then highlighted each node with glow-in-the-dark paint. Next, he stuck the plant in a ceramic pot and rotated it under a black light, exposing a sheet of 4 x 5 film to an illuminated pattern of potential growth. As Charland puts it, "I like the idea of taking something simple and ordinary and making it mesmerizing."



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issue December

TEXT Liz Stinson



# WHEN WE FRANCHISED WE HAD TWO QUESTIONS:

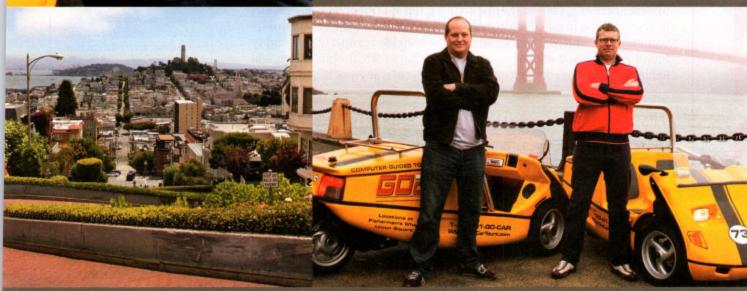
# WHO'S RUNNING IT? AND WHEN CAN WE MEET THEM?

-Alasdair Clements and Nathan Withrington, GoCar founders

GoCar is the GPS guided tour that's been nominated for TIME Magazine Invention of the Year. So when Alasdair and Nathan expanded internationally, they wanted to know the name they'd spent years creating was in good hands. British Airways allowed them to meet franchisees face-to-face and ensure that each outpost lived up to the promise of the GoCar brand.

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MAKE IT SNAPPY

## THE ART OF THE ELEVATOR PITCH

How the perfectly distilled idea became the antidote to toxic punditry.





ot a sec? Then I've got one blockbuster of a column for you: It's about how the "elevator pitch" evolved from sweaty-palmed business ritual—a form of white-collar panhandling perpetrated by pushy salespeople and desperate screenwriters—into the quintessence of the Big Idea. At the marketplace, the multiplex, the dinner table: Everybody talks in elevator pitches, tweets in elevator pitches, thinks in elevator pitches. And that's fortunate, because wielded properly, the mighty Elevator Pitch could actually save us from the forces of fear, obfuscation, and delusion that savage our culture. That's the gist of it anyway. Whaddya say?

You're still reading, so I'll consider you hooked. But then, I've got a bully pulpit. The original elevator pitch was designed for an outsider schmo with nothing but gumption and a million-dollar idea. He corners the Big Boss in the elevator—the one place he can secure a private papal audience lays out his entire prospectus in less than a minute, and closes the deal before the doors ding open. The notion seems to have edged its way into business-speak during the mid-1980s, when the Big Idea went aerodynamic. (You had to dream in terms that Reagan could comprehend: "A space laser shoots down Russkie nukes. We're calling it Star Wars!") The phrase quickly caught on in Hollywood, which saw an uptick in the sort of high-concept movies ("A robot is taught how to love ... by Steve Guttenberg") favored by low-patience executives.

The phrase didn't truly conquer the ver-

nacular, though, until Web 1.0. Before the dotcom boom, geeks weren't called upon to hawk their wares. They built stuff; other people sold it. But during the tech gold rush, as every programmer and engineer became a potential entrepreneur, the propellerheads found themselves at the mercy of fickle venture capitalists. So they learned the art of the elevator pitch, which had a built-in appeal for the right-brained: It gets to the point quickly, lucidly, and logically, with a minimum of stochastic blab. "eBay: It's a zero-inventory retail auction website where users furnish the product, other users bid on it, and algorithms wield the gavel." Sold! "Minnesodors .com: We send expatriate Minnesotans a different, comforting smell from their home

state each week—snow, hotdish, Garrison Keillor. How do we do this? With computers. Yeah, we're still working out the details, but ..." Ding. Time's up!

Today, the elevator pitch has outgrown its original industrial-age metaphor and expanded into mass culture. Terms like biztweet, twitpitch, and twitch are fast replacing Otis' creaky box-lift, but the idea is unchanged. Of course, some might claim this is a bad thing, that constant elevator-pitching is just another symptom of a sick, overstimulated, hopelessly soundbitten society in which glibness rules. But an elevator pitch isn't a sound bite. It's an idea in miniature: a full three-master built to scale in a bottle. It's got to be complete, logical, and watertight, stem to stern. A good elevator pitch is the antithesis of a sound bite-and the cure for the common cable-talking-head ramble. Bloviators and professional obscurantists can confuse the basic contours of reality by stringing daisy chains

of selective facts into dark webs of bigotry and paranoia. Yet ask them to boil down their conspiracy theories, nebulous prejudices, and voodoo economics to an elevator pitch and they'll crumble.

Maybe it's time we learn what movie producers and angel investors have known for years: Glib is good. Lousy ideas often reveal their weaknesses when presented in crystallized form—if they can be crystallized at all. Gassy vagaries are something we can't put up with in an elevator—or in life. The room's too small and the ride too short for that sort of noise. Make sense, be bright, or get off.

EMAIL scottiswired@gmail.com.

0 9 8

ISSUE December

ILLUSTRATION Leo Espinosa

# HOLY SCI-FI.

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# Things We Want

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PHOTOGRAPHS OF CANDY SCULPTURES BY Massimo Gammacurta . PHOTOGRAPHS BY Stan Musilek













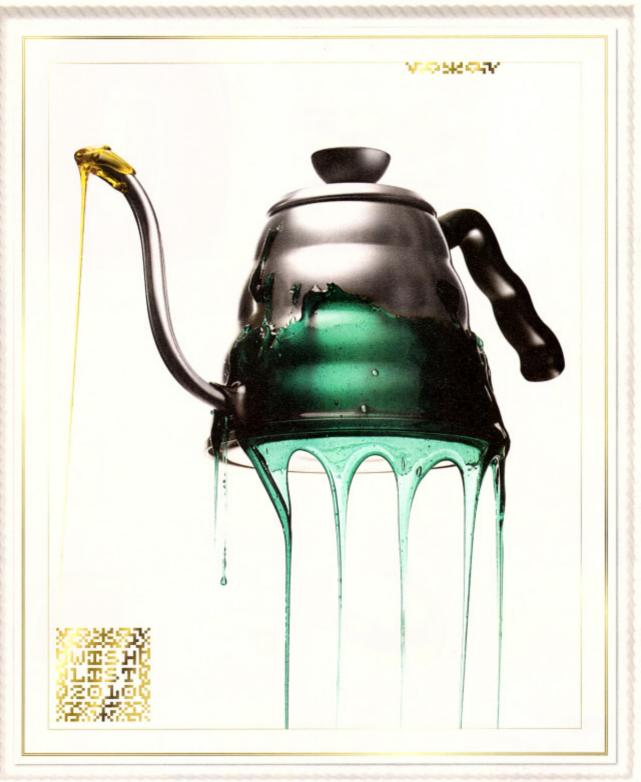




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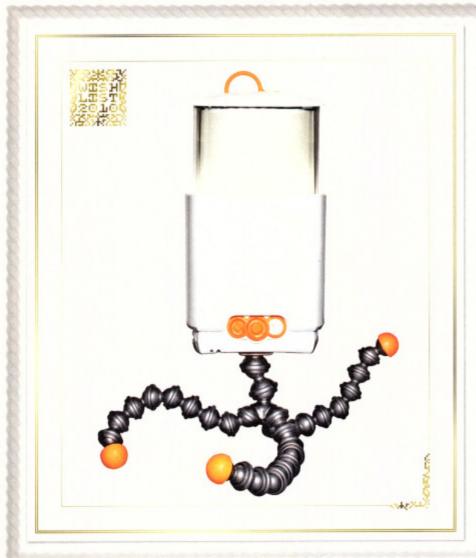
- 1860 Edouard Heuer founded his workshop in the Swiss Jura.
- 1916 First mechanical stopwatch accurate to 1/100th of a second.
- 1969 First automatic chronograph.
- 2010 Grand Carrera Calibre 36 RS Caliper Chronograph, the first automatic instrument mastering and displaying 1/10th of a second.



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# 04 Panasonic HDC-SDT750K 3-D Camcorder Your movies lack depth. Equipped with a detachable 3-D lens to capture legit side-by-side frames in HD, this handheld also boasts a Leica Dicomar lens and 3MOS sensor that shoots a solid two dimensions in full 1080p. How do you say "Take that, James Cameron" in Na'vi? | \$1,400





#### 05 nPower PEG

Even if strolling to the mailbox is your idea of a workout, you're wasting energy. Like a middle-brow Rolex, this 9-inch cylinder captures watts via movement. A short walk charges the battery with enough juice to power up a dead cell phone for an emergency call—like, say, to the pizzeria. Enjoy that slice; you earned it! \$150

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07 American Innovative Teach Me Time
Joanna Pearlstein,
Senior Editor, Research
I need to teach my
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digital formats, packs a
night-light, and, for the
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snooze button. | \$38



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Its all-steel tripod design
is flexible enough to
hold your tablet in
several positions but
strong enough to withstand a day at the bottom of a messenger
bag. | \$40



09 Sony RDP-X50iP BLK Dock Portability isn't exactly synonymous with big, booming sound. Yet this itty-bitty box, just over a foot wide, manages to pack in the jams. It squeezes out a sublime 40 W through a pair of 3-inch woofers. If that's not enough, the auxiliary port allows you to

humor people still rock-

ing a Walkman. \$200





StealthArmor iPhone Case Laser-cut from a 0.01-mm-thick polymer film originally designed to protect race car paint jobs from flying debris, the StealthArmor iPhone case might be overkill. Good! You just signed over \$300 and two years of your life to that new iPhone. You might as well take care of it. From \$25



11 ThinkGeek
Molecular Gastronomy Starter Kit Want
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crazy cook kit will have
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bacon and spherical tea
in no time. It includes
sodium alginate, calcium salt, agar-agar, carrageenan, ascorbic acid,
and everything else you
need to bewilder your
dinner guests. | \$70



#### 12 Nelson 50503 Industrial Nozzle

Pulling back the Nelson's macho fireman-style grip may be the only way to look totally badass while watering tulips. You'll cut time with triple the flow of a typical garden-variety nozzle. Commanding up to 250 psi, it can knock bird poop off a second-story window. But don't get carried away: If the neighbor's house catches fire, you should probably still call 911. | \$20

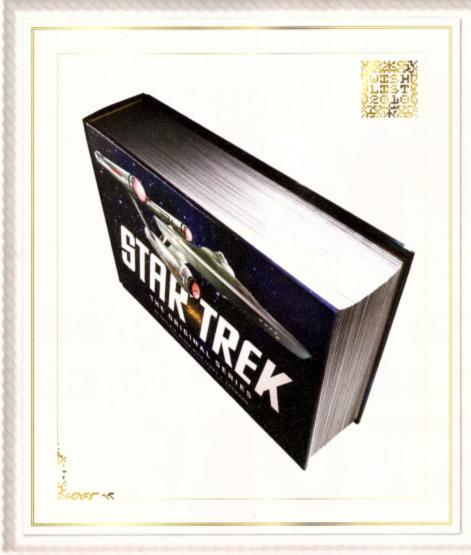


# I want to make it great so I can sell stuff to buy more

My name's Trent and I buy and sell all sorts of stuff: a bike for my son, 3 burner grill for me. I track my sales using mini graphs called Sparklines that I insert into my spreadsheet in new Excel® 2010. Tells me my net-net fast-fast. So I know if I can afford more stuff.

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Star Trek: The Original Series 365 (Abrams)

Nerd alert: Your Starfleet Combadge-shaped coffee table is inadequate without this paean to TOS. Hundreds of rare images and remastered stills are paired with stories from cast and crew about the 1960s "special effects" and inspirational moments in the writers' room. One quibble: 365? This book's too short! Everyone knows there are 384.2 days in the Klingon Imperial Calendar. | \$30



14 Adventure Medical Kits SOL Origin

One missed trailhead and your backwoods get-together can go full-on Donner party. That's why we dig the water-proof SOL Origin. It stows the essentials you need to stay alive until rescue arrives yet fits easily into the decapitated skull of your campmate. Or, you know, a jacket pocket. | \$60



15 J.Crew Timex Vintage Field Army

Watch Forget clunky do-everything wrist-watches with dual alarms, chronographs, and lunar phase displays. Even modest mobile phones top that. Stay simple. Timex teamed up with J.Crew to update the classic 1940s military watch. It has two functions: telling time and looking good. | \$150



16 SousVideSupreme Water Bath Sous

vide—vacuum-sealed food prepared in temperature-controlled water baths—delivers succulent and evenly cooked dishes. But professional-model immersion circulators cost thousands. So we're licking our lips for this affordable water bath that brings El Bulli to your kitchen. | \$450

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# ONLINE SHOPS JOIN THE BEST OF BOTH WORLDS



1&1 Internet's CEO, Oliver Mauss, talks about the pros of entering the virtual marketplace and how it can attract online and in-person shoppers.

The impact of the Internet on consumer culture is unmatched. From business to customer, the Web is no longer just the "information highway." It has also become a popular alternative marketplace.

Developing a website into an e-Shop can help increase profit and develop positive customer relationships. From a business perspective, it's always a good idea to showcase products online. It can help turn site visitors into foot traffic at the physical store. Even better, if a website has an e-Shop function for processing purchases, then the business has a second avenue for generating profit.

For consumers, it's a matter of convenience. To research and purchase a product safely from their personal computer is a great example of our culture's desire for instant gratification. But for those who still like to physically shop, researching a product before they leave home is just as valuable. It's Window Shopping 2.0.

The busy holiday season is the perfect time to make a website really work to a business' advantage. It's a sales channel for some, a shopping convenience for others.

Visit 1&1 at the WIRED Store in NYC from November 19th to December 26th! Product experts and special offers will be available to you.



# **DROID DOES**

TheCompetitiveEdge.com.



### With gifts like these, how can you lose?

The Droid army has united this holiday to awe everyone on your gift list. Droid X, Droid 2 Global, and Droid Pro are armed with access to thousands of free apps, lightning-fast processors, and an entertainment theater of movies, games, and the Web. Three devices with one common goal—a more powerful you.

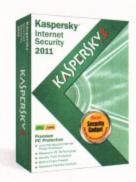
Learn more this holiday season at droiddoes.com





# KASPERSKY INTERNET SECURITY 2011. THE FASTEST, SMARTEST, KASPERSKY YET.

Innovative technologies keep you safer.
An intuitive interface makes it easier.



Our most advanced security software, Kaspersky\* Internet Security 2011, combines essential anti-virus protection with additional layers of defense, such as firewall, anti-spam, parental controls, and more.



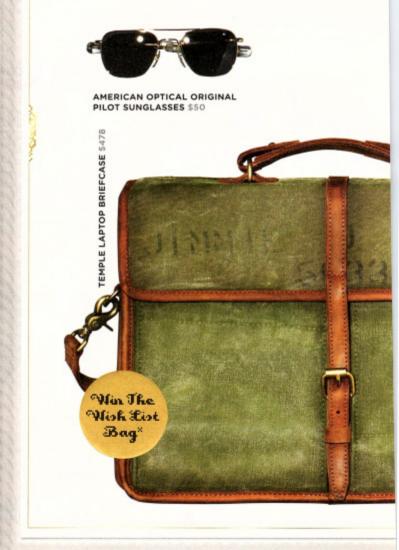
www.kaspersky.com/bloggers



# The Ultimate Gift Bag

The greatest gift you can give yourself is a new beginning. What if you could start again, with nothing from the past to bind you? Where would you go? What would you need? More important: What could you live without? Instead of cluttering our drawers or locking us into upgrades, gadgets should make our lives easier, more productive, and even happier. They should be powerful yet utterly simple. So we put together the ultimate gadget bag as if we were starting from scratch, with no technology legacy around our necks. From productivity to recreation to style, this kit covers it all. This is the rig we'd throw over our shoulder on the way out the door, never to look back again. Happy holidays; happy new year. Start fresh.

\*NO PURCHASE NECESSARY. To enter and for full rules, go to wired.com /magazine/bagsweepstakes. Starts 12:00 NOON ET 11/20/2010 and ends 11:59 PM ET 2/4/2011. Open to legal residents of the 50 United States/D.C. 18 or older, except employees of Sponsor, their immediate families, and those living in the same household. Odds of winning depend on the number of entries received. Void outside the 50 United States/D.C. and where prohibited. A.R.V. of grand prize: \$2.679. Sponsor: Condé Nast.









CANON S95 CAMERA \$400

DALVEY FLASK WITH TELESCOPING CUP \$118

VIDWON

MATIAS FOLDING KEYBOARD \$70









FIIO E5 HEADPHONE AMPLIFIER \$18



**COUNTY COMM EMBASSY PEN \$39** 





APPLE IPAD 3G \$629

# BRAUN Series 7



View the video on braun.com

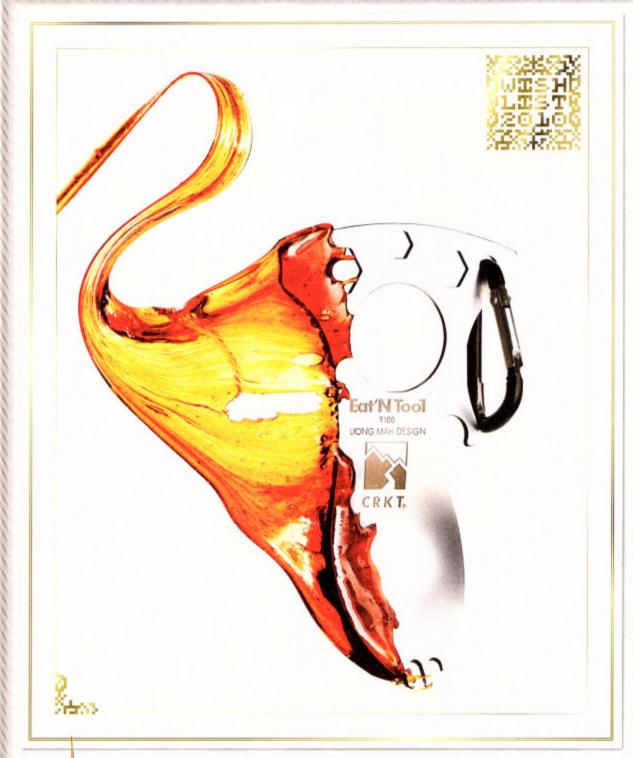


"I have reinvented myself

Wear

many times."

# your face.







## **CRKT Eat'N Tool**

Sporks are the mullets of casual dining, but the Eat'N Tool deserves some respect. Designed by a company that makes anodized aluminum pens and wicked combat knives, it's loaded with a bottle opener, screwdriver, carabiner, and three wrenches. Better yet, it can save you the indignity of eating pork-fried rice at your desk using a pair of Ticonderogas for chopsticks. | \$7





# FROST THE FIRE

Smoke-free, Spit-free and Drama-free

**Camel SNUS** is the tobacco pouch perfected. Simply place one under your lip and enjoy the bold refreshing flavor that's **sold cold** for ultimate freshness.

Camel SNUS—the pleasure's all yours.



camelsnus.com\*

\*WEBSITE RESTRICTED TO LEGAL AGE TOBACCO CONSUMERS.

SNUS

WARNING: Smokeless tobacco is addictive.



# not from the future, for it.

It can tilt up to 25 degrees, move in six directions at once and provide the sensation of traveling 186 miles per hour. This is the world's most advanced driving simulator. Where drivers in an actual Lexus navigate their way through a 360-degree virtual world. This allows us to analyze their reactions to real-world situations without real-world consequences. Our hope is that someday it may help us develop a car that will never have an accident. Sound like science fiction? We've been hearing that for years.

This is the pursuit of tomorrow.

This is the pursuit of perfection.



portability. \$250



32 Dixit Chris Baker,
Senior Editor | I'm sick
of dusting off Trivial
Pursuit at holiday fetes.
This year, I'll bring an
elegantly simple board
game that will have us
spinning yarns about
abstract pictures. Dixit
swept the European
board game awards—
which are like the Oscars
but more cutthroat and
less riddled with production numbers. | \$35



33 Cervélo R5CA
Did you know that your
fancy carbon bike was
likely assembled in a
Taiwanese plant with
dozens of other brands?
Grab the top-of-theline ride from Cervélo,
though, and you get
a bicycle that's not
only insanely light and
strong but one that's
built by the same California engineers who
designed it. | \$9,800



ble stick uses a liquid (not ink!) that sticks to paper like graphite and can still be erased up to 24 hours after application. After that, marks become permanent.

Pencils down. | \$2



35 Pinel and Pinel Arcade 80's Trunk

Did you spend the 1980s fighting Space Invaders instead of dating? Relive those times of self-inflicted celibacy! Loaded with 60 classic titles, from Pac-Man to 1942, this rig also sports a 1080p screen. But it's priced like a new Honda, so you'll have to start saving quarters again.



Hi-Tec Art LED Map of the US Nothing says "evil genius with a scheme for world domination" like a wall map with light-up pushpins. This US map comes with 100 LED pins; push them into the map's foamy surface to make contact with the electrical layers below. Includes two blinky lights to mark your lair or next target. | \$200



37 Patagonia Men's Down Sweater, Special Edition

This translucent ripstop nylon shell is a sweater in name only: It's filled with premium European goose down and sports a snow-shedding finish, heat-saving cuffs, and an internal pocket that doubles as a stuff sack. It's a hardcore yet lightweight (10-ounce) jacket that's sleek enough to take you from day to night, no matter how fancy the peak you're camping out on. | \$275

# ELIMINATE REGIFTING.



This holiday season, give the world's finest ultra-premium tequila. Made with only hand-selected 100% Weber blue agave.

SIMPLY PERFECT.





## **Bowers & Wilkins P5 Headphones**

The subtle biomimetic cant of the head strap, the soft sheepskin and supple memory foam of the ear cups, the beautifully balanced sound of the drivers, the microphone for making calls: This is a pair of headphones made by people who never liked a pair of headphones before. This is a pair of headphones made for people who never knew they could love a pair of headphones before. **\$299** 



#### 39 Chloé Dionée Folding Sunglasses

If Corey Hart had sung the truth, the line would have been, "I wear my sunglasses at night cause they're too bulky to fit in my pocket after the sun sets." These retro frames with gradient lenses fold down to a lens-sized package and tuck neatly into even the skinniest of jeans. | \$398



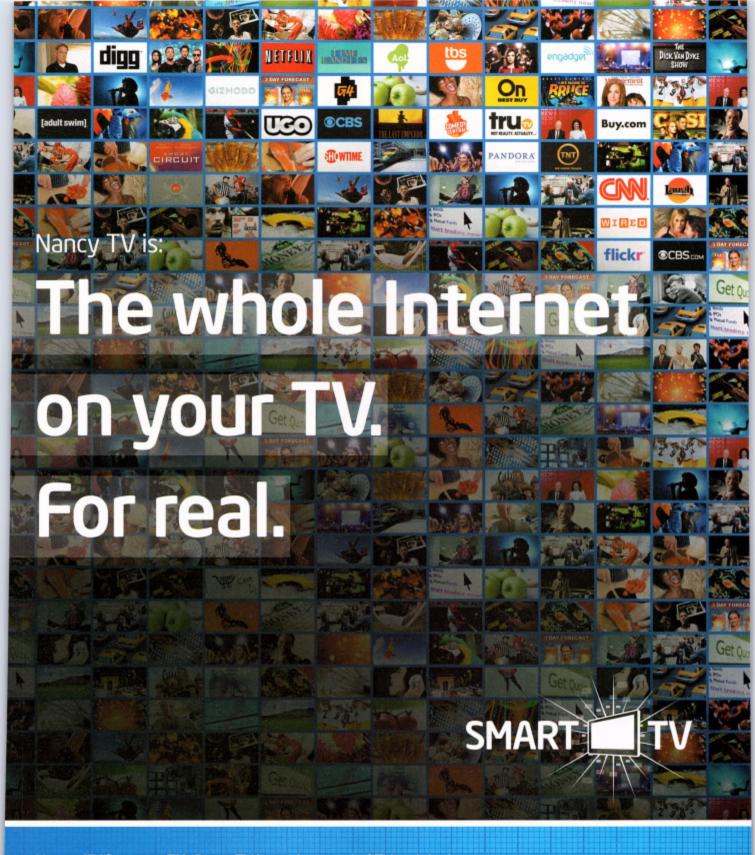
## 40 Denon AVR-A100

Although it celebrates the past, Denon's 100th-anniversary box is straight out of the future. The 9.2-channel receiver uses digital processing to measure, analyze, and correct for room acoustics. Optional AirPlay support means it can talk to iTunes, and a remote app for your iPhone lets you control it. | \$2,499



#### 41 Freebord Bamboo Series All Around

This six-wheeler offers all the fun of snow-boarding (carving, drifting, spinning) without the negatives (lift lines, skiers, wasting half your paycheck). A swiveling wheel on each end of the bamboo-and-maple deck lets the board move laterally, opening up a whole new dimension of moves. | \$230



**Nancy TV is smart TV.** Smart TV is you in control of TV and the Internet on one screen. It's searching for and watching your favorite TV shows and movies, downloading apps, even surfing between channels and web sites. Imagine the possibilities with the performance of Intel inside your TV.

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need a phone as turbocharged as you





Your phone is much more than just a phone. It's your lifeline. And since you're the kind of person who makes the most of every minute, you need a phone that does too. Introducing the G2 by HTC. The first smartphone with 4G speeds on T-Mobile's new network. Delivering the best of Google, faster than you ever thought possible. Exclusively from T-Mobile.



#### htc.com





## 42 Betabrand Cornucopia Shopping Bag

Can't juggle a dozen compostable bags of organic produce? This shopping backpack zippers into three separate compartments to protect your mizuna greens from your winged yams. And the comfortable shoulder strap makes you feel even better about supporting your local farmer. | \$120



### 43 Wüsthof Attaché Case 9778 Mere cooks

might roll up to a holiday dinner with a towelwrapped butcher's knife. Top Chefs-in-training come correct with a classy 19-piece assemblage of German steel suited for every task from carving the bird to balling the melon. A handsome case keeps it all in place; snootiness

not included. \$900



## 44 Moji Knee Brace

Leaky Ziplocs? Cumbersome gel packs? Insult to injury! We'd rather strap on this cryotherapeutic super-brace. With its 18 conformable quick-freeze pods and easy-to-adjust fleece compression wrap, the Olympian-worthy rig is not only comfier than a mink-lined mitten, it's cheaper than cortisone injections. | \$90



#### 45 Rockler Bench Cookie The hockey-

Cookie The hockeypuck-sized Bench Cookie just, well, sits there. Under your laptop to let it cool, under a piece of wood you're sanding, under a couch leg you're trying to keep off the hardwood. The textured top and bottom keep it from sliding, so your projects stay where you want them. | \$12 (set of 4)







## Public Bikes D8

The D8 is a versatile eight-speed workhorse with just enough design-y elements (pretty colors, chain guard, and a classic diamond frame shape) to make it covetable. Easy-on-the-ol'-back upright handle-bars along with 35-mm tires that can handle curbs, potholes, and the Friday afternoon scramble make this your new go-anywhere, do-anything ride. \$850



Every curve. Every contour.
Philips Norelco SensoTouch 3D. Our most advanced shave yet.

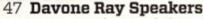


It takes a lot of technology to make shaving feel as easy as this. The Philips Norelco SensoTouch 3D's GyroFlex system adjusts seamlessly to the contours of your face. Its UltraTrack system uses three specialized heads to smoothly cut every length of hair. The result is a shave that is not only flawless, but effortless too. Find out more at www.philips.com/sensotouch









Sure, an Eames lounge chair makes your living room look awesome, but come on—it just sits there. In this economy, even furniture better pull double duty. These seven-layer, bent-ply walnut speaker cabinets won't just amp up your pad's mid-century vibe; they'll pump out 150 watts through dual 8-inch coaxial drivers. It's quite the sound investment. \$5,995 (pair)



#### 50 Photojojo Magnetic Lenses

Your phonecam is the only picture-taker you're packing these days, so make it better with these peepers that snap over the existing lens via a magnetic ring. The combination wide-angle/macro and fish-eye attachments will improve your Twitpics and your phone-tographer bona fides. | \$40



#### 51 Pure Evoke Flow

Is it the future already? Chances are your Wi-Fi signal is stronger than your FM one. So why bother? Take Internet radio anywhere you go with the Flow, a slick, touchscreen, 802.11b-loving tuner that organizes a whole world's worth of stations into a slick GUI. Feeling nostalgic? It's got FM, too. | \$210



#### E FACKE LIOM

Jacket Mark McClusky, Special Projects Editor! The masters of overthe-top cycling gear collaborated with London tailor Timothy Everest to merge fashion with bike-friendly function, like a back that flexes for riding and buttons that keep the front end of the jacket out of the way. | \$560

52 Rapha Tailored





#### Nau Fluent Stash Organizational Bag

Made from 100 percent recycled, die-cut wool felt, Nau's origami-style bag packs down small yet opens wide to reveal a multitude of snapping, zipping, and folding pouches. Hang it over the towel bar or fold it back and prop it up on itself; it's as accommodating as a geisha, with way more pockets. | \$80



## 49 Yamaha Zuma

125 Non-Italian scooters typically have all the street cred of a babyblue Mazda Miata. But with its strong frame, dual shock absorbers, and fat, knobby tires, the Zuma 125 delivers the cool. It tops out around 60 mph and isn't confined to paved roads. Best of all, you won't mind if your friends see you riding it. § \$3,250



## 53 Bear Grylls Survival Series Ultimate

Knife This Gryllsmeets-Gerber blade cuts through the BS. In addition to its partially serrated, high-carbon stainless-steel blade, it holds a sharpener and fire starter in its sheath. It's all you need to be the Bear (charming British accent and hotel room keycard not included, of course). | \$80



# ADVENTURE AVAITS HOLIDAY GIFTS FOR OUTDOOR ENTHUSIASTS FROM GLENFIDDICH

Exploration and technology have always been closely intertwined, from the invention of sails to geosatellite mapping imagery. Today, technology continues to adapt and morph into new tools for adventurers who seek to challenge their comfort zone and know the rewards that result. Because it pays to go prepared when you set out on those journeys, here are some ideas for gear that will get you there and back.

# FOR HIKERS

Don't walk in anyone's bootsteps when a HIKER'S GPS can provide satellite navigation, aerial photography and up-to-date information on the terrain ahead, in any location. These handhelds let you download maps and trails, share waypoints with fellow hikers, send instant SOS or OK signals back to base, and even shoot and geotag photos along the way. Many units include altimeter, barometer and compass functions, timekeeping and solar charging to keep you on the go-wherever you go.

# FOR ADVENTURE TRAVELERS

Savvy trekkers know to "pack right, pack light" when venturing out into the wild, and an ultra-compact **EVIL CAMERA**—for Electronic Viewfinder Interchangeable Lenses—lets you travel light and maintain a down-low profile when you're capturing the local color. With these pocketable, pro-grade shooters, fast sensors replace slow, noisy shutter mirrors, and supercompact lenses are easier to carry than bulky, heavy DSLR lenses.

# FOR SAILORS

blows-at home, at the dock

Always know which way the wind

or out on your own boat —with a DIGITAL WEATHER STATION. Today's full-featured setups track and compile complete atmospheric data and allow you to download it to your computer for long-term weather profiling in your specific location. Remote sensors report precise, micro-climate information from multiple points within receiving range of the base unit, so you won't need a weatherman to tell you when to set sail.



STATUTE STREET, STREET

SKILLFULLY CRAFTED. ENJOY RESPONSIBLY

THE SPIRIT OF A PIONEER





# TOUCH COLLECTION: T-TOUCH II

An innovative and sporty design with touch features that include a compass, thermometer, altimeter, relative air-pressure, a perpetual calendar, and two alarms. This Touch design includes high-quality materials such as a titanium bezel and bracelet, scratch-resistant sapphire crystal, and water resistance up to 100 meters.



# THOUGHTS ON A SMARTER PLANET

A Special Guest Blogger Series

Join the conversation as leading experts from IBM discuss the innovations in science, business and systems like transportation that are helping build a Smarter Planet. Meet this month's guest bloggers on Epicenter:



Dr. David Ferrucci is a Research Staff Member and Department Group Manager at IBM's T.J. Watson Research Center. He manages the Semantic Analysis and Integration department, which is focused on natural language processing (NLP) technologies for discovering relevant knowledge in structured and unstructured information sources and leveraging the results in a wide range of search, intelligence, and information management solutions.



Juhnyoung Lee is a Research Staff Member and Manager at the IBM T. J. Watson Research Center in New York. He is currently working in the Business Informatics group. His research interests include cloud computing, e-government, service engineering and management, business and IT modeling, and model-driven business transformation.



Dr. David Cohn is Director of Business Informatics at IBM's T. J. Watson Research Center. He supervises a research team focused on modeling, transforming, and integrating information and business structures for on-demand solutions.

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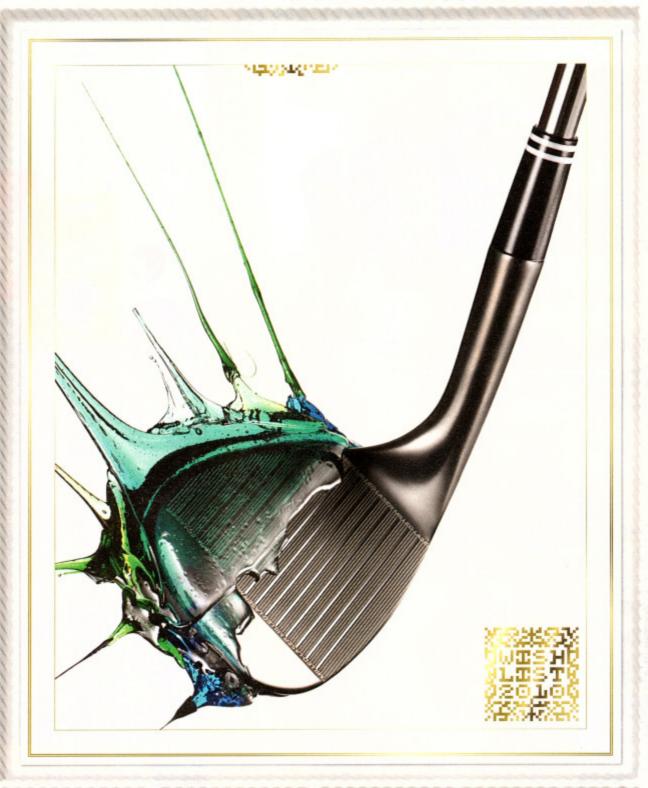
Offer for two \$10 Gift Certificates good toward any Natural American Spirit products of greater value. Offer restricted to U.S. smokers 21 years of age or older. Limit one offer per person per 12 month period. Offer void in MA and where prohibited. Other restrictions may apply. Offer expires 06/30/11.

# **CIGARETTES**

No additives in our tobacco does **NOT** mean a safer cigarette.

SURGEON GENERAL'S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, And May Complicate Pregnancy.

Natural American Spirit® is a registered trademark of Santa Fe Natural Tobacco Co. © SFNTC 4







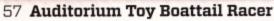
Cleveland CG15 Wedges
Hacking your iPhone? Fantastic! Hacking the back nine at Pebble? Less so! If your strokes have a preternatural attraction to sand, adding a CG15 wedge to your bag will give your bunker shots more spin than Fox News. But do it fast: These sticks generate so much rotation that you can't buy them after 2010. Don't worry, amateurs can still hit them through 2024. \$120



Your favorite Starbucks Christmas Blend is back and now available in Starbucks VIA\* Ready Brew instant coffee and delicious whole bean coffee. Specially crafted with notes of sweetness and aged Sumatra spice, it's perfect for gifts or to make every morning special. You'll jingle all day long.

SHARE IN THE TASTE OF THE SEASON WITH STARBUCKS.





If box tops could still be traded for toys, this handcrafted wooden car would require a factory's worth of cardboard collateral. But after scoring the Boattail, you'd be set for life—literally. The 9.3-inch-long aerodynamic heirloom toy, with its carnelian-core wheels, precision bearings, and stainless steel axles, is built to be passed down from generation to car-loving generation. | \$350



## 58 Icebreaker Men's Aspiring Hood

Synthetic fleece has ruled the outdoor roost, but the original fleece—wool—is pretty darn technical stuff, too. Icebreaker's itchless zip front provides both an insulating layer in horrible conditions and a jacket on cool days when you don't want to look like you're about to tackle Everest. | \$200



## 59 CGear Sand-Free Multimat US military

forces use these outdoor mats to prevent helicopters from kicking up visibility-killing dust clouds. At the playground, the mat's polyethylene mesh strains dirt particles and won't let them resurface, keeping sand out of your sandwich. No black-ops picnic is complete without one! | \$50



# 60 Canon EOS 7D

Viva Barrows, Video
Editor I need a rig that
marries photo and video,
but doing both well
depends on three words:
frames per second! With
up to 60 fps in HD and
SD video, what you see
is really what you get.
Add 8 fps in continuous
shooting mode for stills
and nothing else in its
class can put that combo
in its vows. | \$1,699



#### 55 DeLorme Earthmate PN-60w The

built-in topo maps on this handheld GPS should keep you from getting lost, but in case you do, it can send your coordinates to overhead satellites via text message. You can even use it to update your Twitter or Facebook status: "Reached summit. Need to resupply. Please send @beerrobot." | \$550 |



#### Koziel Trompe-L'Oeil Wallpaper These

sheets turn flat surfaces like doors into faux portals, opening all sorts of paint-free possibilities. Prints include a stairway to the catacombs, an escalator to the astral plane, and an array of illusory fringes. Want to turn your headboard into a creepy theater curtain? Let the show begin. | \$49-199





### 61 Clean Bottle

It's the eternal curse of the plastic water bottle: At some point in its life span, something supertoxic will collect at the bottom—something that resists all reasonable efforts at removal. The solution? This two-sided vessel with an easy-to-clean screw-off bottom. Finally, no more energy drinks fortified with mold! \$10

Windows®. Life without Walls™. Acer recommends Windows 7.





Acer® Aspire® 5820 Part Number: AS5820T-7683 (LX.PTG02.156)

- Genuine Windows® 7 Home Premium
- 15.6" HD LED-backlit display
- · 4GB DDR3 SDRAM, 320GB1 hard drive
- Intel® Core™ i3-370M Processor

\$699.99







Your PC, simplified. Windows 7



Windows®. Life without Walls™. Acer recommends Windows 7.

# More than just

More than 8 hours<sup>2</sup> of excellent performance in a thin and light design

The Aspire TimelineX is a family of ultra-slim vet extremely powerful laptops ranging from the incredibly compact 11.6" and 13.3" models up to the super-sleek 14.0" and 15.6" versions.

All feature ultra-powerful processors and graphics, 16:9 HD screens, Dolby® Home Theater® v3 and an HDMI™ 1.3 port, yet each is only about one-inch thin.3







Your PC, simplified.

Windows® 7 Home Premium operating system: the best entertainment experience on your PC.



The original Aspire Timeline series was the first to break the 8-hour battery life barrier and the Aspire TimelineX matches that and adds excellent power straight out of the box.

With Aspire TimelineX, power and battery life are no longer incompatible. One push of the PowerSmart button and the Aspire TimelineX transforms into a true all-day companion, or a supremely powerful entertainment device.











all-day companion



# Acer® Aspire® 3820

Part Number: AS3820T-7459 (LX.PTC02.149)

- Genuine Windows® 7 Home Premium
- 13.3" HD LED-backlit display
- 4GB DDR3 SDRAM, 320GB¹ hard drive
- Intel® Core™ i3-370M Processor

\$679.99





# Acer® Aspire® 4820

Part Number: AS4820TG-7805 (LX.PSE02.311)

- Genuine Windows® 7 Home Premium
- 14.0" HD LED-backlit display
- 4GB DDR3 SDRAM, 320GB¹ hard drive
- Intel<sup>®</sup> Core<sup>™</sup> i5-460M Processor

\$799.99

# More than 8 hours<sup>2</sup> of excellent performance in a thin and light design

The Aspire TimelineX offers more than just time: it gives you excellent performance with Intel® Core™ processors.

It is only about one-inch thin<sup>3</sup> and available in 11.6", 13.3", 14.0" and 15.6" HD widescreen versions with powerful graphics.

When referring to storage capacity, GB stands for one billion bytes. Some utilities may indicate varying storage capacities. Total user-accessible capacity may vary depending on operating environments.
Actual battery life varies by usage, settings and operating conditions.

Actual battery life varies by usage, settings and operating conditions.
The Aspire 5820 is 0.91" - 1.4" high, Aspire 4820 0.94" - 1.13" and Aspire 3820 0.86" - 1.14".

Discover the new Acer Aspire TimelineX laptops at your nearest retail store or visit acer.com/timelinex/en-us

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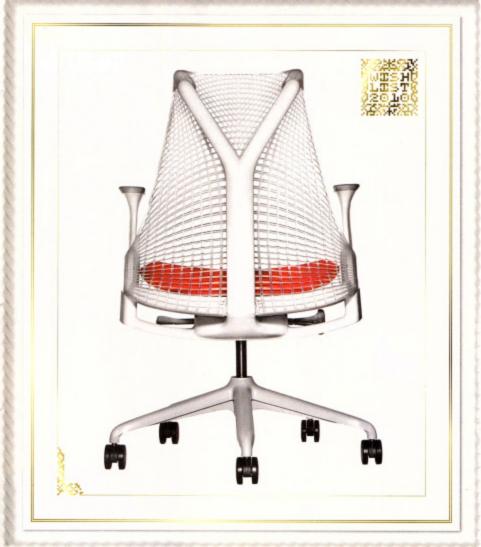
62 Samsung Hybrid Induction Electric Range Turning up the temperature of a range with actual heat is so 20th century. Join us in the now with a stove top that uses magnetism to cook dinner. Heating only the pots and pans—and not a burner—leaves your kitchen cooler and gives you more exacting temperature control. | \$1,799



63 Alessi Kaj Watch
Karim Rashid, the
designer Alessi tapped
for its curvaceous timepiece, bills himself as a
"cultural provocateur."
The watch, he says, is
symbolic of technology
and the cosmos—representing reductive sensualism and the cyclic
nature of time. Whatever. We think it's sleek,
looks great, and comes
in 12 cool colors. | \$110



64 Philips DLO
WallDock Often the
simplest reinventions
are the most satisfying,
like this cord-free charging dock that (get this)
plugs directly into the
wall. No snaky cords to
junk up your desk or for
the cat to go suicidal on.
Just a pillow-top block
with a connector that
lets your iThings rest
against the wall while
they recharge. | \$30





## Herman Miller SAYL Chair

To achieve Aeron-like comfort at a fraction of the price, Yves Béhar designed a piece of furniture as easy to make as it is to sit in all day. Instead of lumbar support members, he created a variable-thickness mesh. Instead of a complicated frame, he turned the entire back into a suspension-bridge-inspired network of stressed catenaries. Look for it soon in a cost-conscious startup near you. | \$400







66 RockPaperRobot Float Table This levitating table harnesses the miracle of magnets in a way we never dreamed of, using their opposing force to create visually stunning yet functional art. Sixtyfour magnetized cubes are held in equilibrium by tensile steel cables, making this table both ethereal and surpris-

ingly tactile. \$2,000

## 67 Soma Inflatable **Surfboard Bag**

Dropping in on a glassy barrel? Stoked! Dropping your board in the parking lot? Harsh! This rugged sack is ready for Whoopsageddon. Beyond the 600-denier ballistic-polyester shell and foam-reinforced rails, air columns lining the top and bottom help disperse force on impact. \$200-320

#### Jaz Innovations Oven Rack Guard

How many fingerprints can you lose on hot oven racks before people start thinking you're a serial killer? These handy shields attach to the business end of your racks, stay in the oven. and keep cool up to 500 degrees Fahrenheit. The only conceivable downside? You were pretty into Dexter. \$10

#### 69 Hot Wheels R/C Stealth Rides

They may not be quite as cool as George Jetson's suitcase aerocar, but these collapsible RC racers actually exist. The car unfolds with the push of a button, then folds flat and slides back into the phone-sized remote control. Total weight: 9.6 ounces. Odds of getting a parking ticket: zero. | \$25



#### 70 Solid Line iPad Case The iPad is great for lots of stuff (like reading WIRED!). But not typing. Mercifully, the folks at Solid Line have come up with an elegant solution: a Bluetooth keyboard built into a dignified leather iPad case. It's always with you, yet never in the way. Good-bye, Auto-Correct, you condescending robot. \$119



# 71 X-Rite Capsure

You found the perfect ecru for your bedroom, but unfortunately it was on the poodle across the street. This color reader grabs hues from almost any surface and accurately matches them to one of the 8,000 colors in its Pantone library, ensuring your options are only as limited as the world around you. | \$649



## 72 Microsoft Arc Touch Mouse

They call it a mouse, but thanks to all its arching and vibrating, the Arc Touch reminds us more of a cat. Flex it and a wireless USB transceiver connects it instantly to your computer from up to 30 feet away. It tracks well on most any surface, and when turned off it's small enough to cram into your pocket. Try that with your kitty. \$70



# THE LINE ISN'T EXPANDING AS MUCH AS IT IS BREEDING.

INTRODUCING THE DROID PRO TO THE GROWING DROID LINEUP. ENHANCED EXCHANGE, AN INTUITIVE QWERTY KEYBOARD, AND GLOBAL READY IN MORE THAN 200 COUNTRIES. EXCLUSIVELY BY MOTOROLA AND AVAILABLE ONLY AT VERIZON WIRELESS. PART OF THE NEXT GENERATION OF DOES

DIOIDPro

DIOIDX











# **Gerstner Hobby Roller Cabinet**

Admit it, apartment dwellers, you'd have fixed that showerhead by now if you didn't need to search for the right tools. Having to use the dining room table as a workbench doesn't help. Gerstner has the answer: The felt-lined drawers in this handsome oak cabinet hold your hammers, hooks, and hacksaws, while the nonslip top provides a handy work surface you can roll to the job site. | \$549



Radiolaria
Bracelet Like a Kardashian, this bracelet gets that elusive real-yet-artificial balance juuuuust right. It's water-jet-cut out of silicone rubber, but it evokes honeycombs and butterfly wings. Interlocking cutouts integrate your skin into the design, making even the naturally pasty effortlessly hip.] \$55



75 11-inch, 64-GB
Apple MacBook Air
It's remarkable that
something so small can
live this large. A slick
multitouch trackpad lets
you gesture your way
through your tasks, The
Facetime app makes
video calls to friends
with iPhones, and flash
storage means it turns
on faster than a teenage
girl at a Justin Bieber

concert. \$999



76 Panasonic
EP-MS40 Massage
Sofa Chair Masseuses
are expensive and occasionally creepy. Why
not get a chair that
caresses your backside sans weird oils? If
you're tied up in knots,
the EP-MS40 will press
them out with Swedish,
shiatsu, and deep-tissue
settings for whatever
needs kneading.
| \$2,500

columbia.com/omni-heat

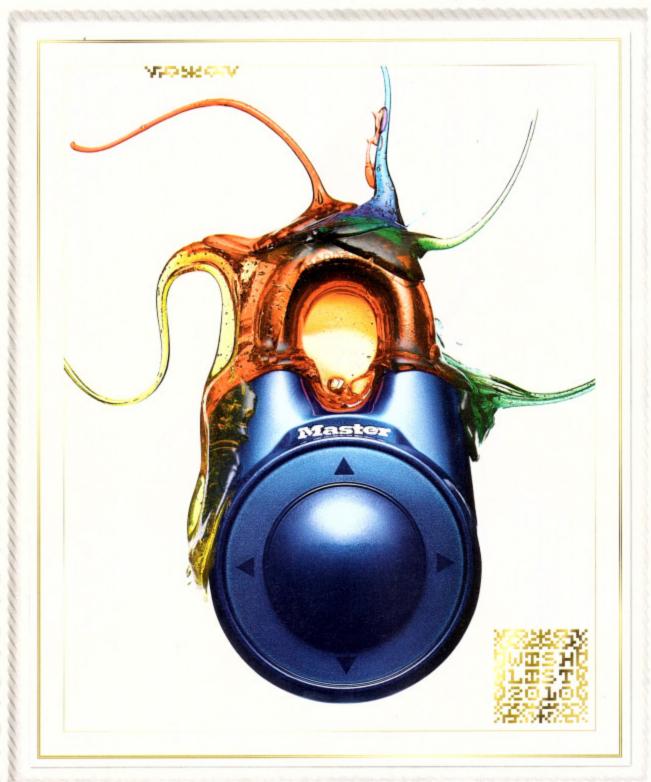


# OMNI-HEAT: 20% WARMER WHEN APPLIED CORRECTLY.



Omni-Heat is 20% warmer than an ordinary lining. It breathes and regulates temperature so you don't get overheated. That's because it's made with a patent-pending silver dot pattern that reflects your heat back to you. All you have to do is put it on. Visit columbia.com/omni-heat to see the warmest jackets tested by some of the coldest people in The Greater Outdoors.

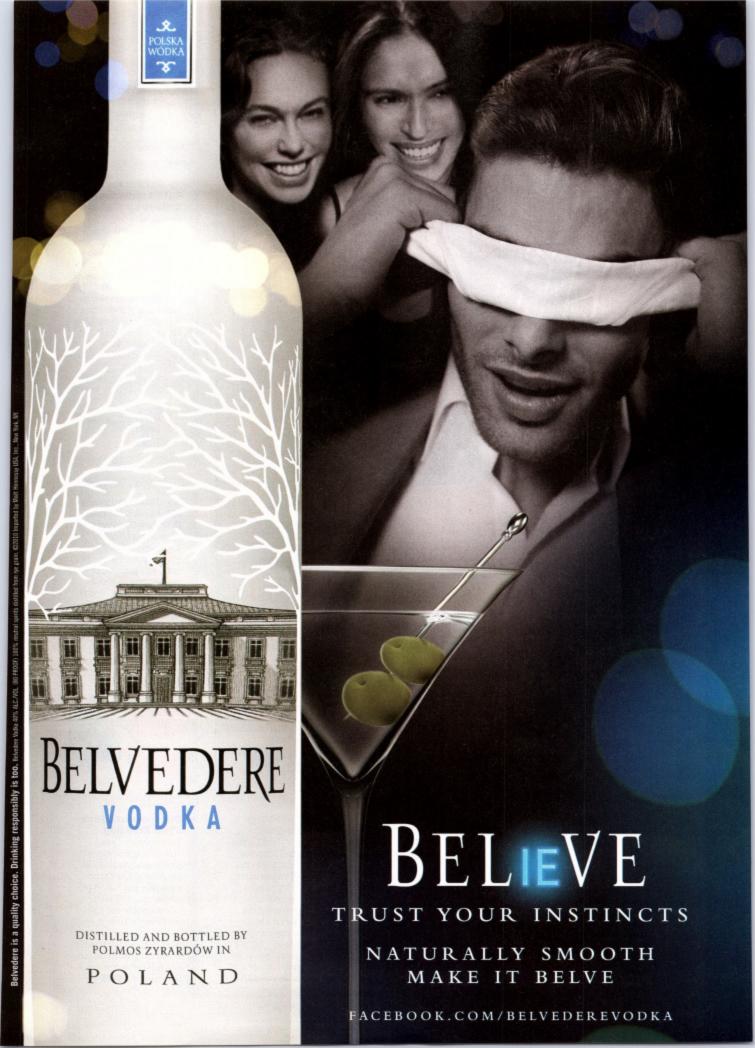


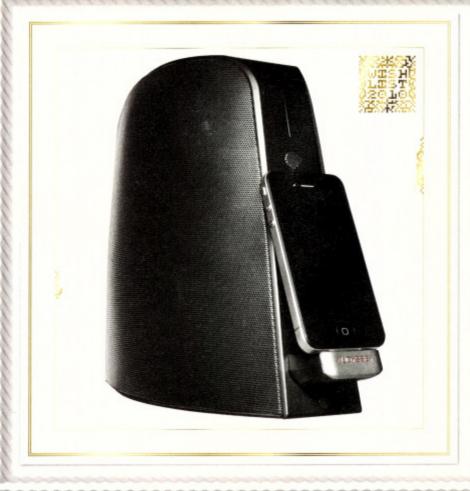


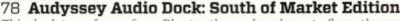


# Master Lock 1500id

This ingenious padlock is like Dance Dance Revolution for your fingers, opening via sequential directional movements. Unlike traditional combination locks, it takes only one hand and zero eyes to pop the tumblers. It's the security breakthrough every eighth grader has been waiting for. Just don't set your combo to the Konami Code unless you want geeks ganking your stuff. |\$13







This dock transforms from Bluetooth speakerphone to floor-thumping 200watt music player with the press of a button. The side-firing tweeters enhance separation in tight quarters, so music comes out loud and clear, and if you need a midrange boost (and who doesn't?), use the iPhone app to create custom EQ curves and rock your own sound. Now hang up and dance. \$399



81 Uni-ball Kuru Toga Pencil Obsessing about pencils is the new obsessing about pens, and nothing beats the Kuru Toga for excessive engineering. The name means "arrive sharp" in Japanese, and it refers to the tiny mechanical clutch that rotates the lead to prevent a chisel point from forming. Hey, we warned you it was obsessive. \$9



82 Lego Hoth Wampa Cave Can't wait for Star Wars in 3-D? Use the Force (or a credit card) to acquire this 297-piece Lego set. Then commemorate the 30th anniversary of Empire by reliving Luke's battle with a grumpy wampa. Included: lightsaber catapult functionality! Not included: breath mints for the wampa. | \$40



83 ART USBPhono-Plus v2 Jon Eilenberg. Story Editor | I still have crates of vinyl from my punk rock youth. But my newfangled stereo can't handle old-school analog turntable signals. This handy box serves as a traditional phono stage or headphone amp and connects to a PC via USB to translate my copy of Bad Brains' I Against I from wax to .wav. | \$80



#### 79 Back to the Future 25th Anniversary Trilogy on Blu-ray

This special HD edition features brandnew restorations of all three films, plus a sixpart retrospective documentary that includes interviews with the cast and filmmakers. Turns out living in the future is pretty awesome after all, even without flying DeLoreans. \$80



#### 80 Jaclo Aquavolo MP3 and Chromatherapy Showerhead

Blame this thing for your ridiculously long showers. It combines colored lights, your MP3 player, and variable water pressure-from rain showers to waterfalls. With the Aquavolo system, you can belt out tunes under disco lights while getting so fresh and so clean. | \$8,500



### Dodocase and Rickshaw Zero Bag

This cheeky case/ stand-bag combo will make you the envy of your café. The Dodocase lets your iPad go undercover as a Moleskine notebook, complete with strap. It fits in Rickshaw's customizable bag, which is cut to ensure no fabric scraps are wasted during manufacturing. \$115

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VIETA EDILLAD









85 Innate Doppio Cappuccino Tumbler

As coffee nerds, we love the slew of cool vacuum cups that have flooded the market in the past few years. But many share the same problem—they're made for a big hit of brewed coffee, not smaller drinks. This pipsqueak sipper keeps your double cappuccino hot and looks cute as the dickens to boot. | \$9

86 Halo: Reach
Hey, Mr. Lucas, guess
what? Prequels don't
have to suck. Exhibit A:
Halo Reach, which
trumps the original tril-

Halo Reach, which trumps the original trilogy with highly evolved combat, crazier weapons, smarter baddies, and deadlier moves. Stealth assassinations anyone? And remember, unlike a certain scruffy nerf-herder, this Spartan always shoots first. | \$60

87 L.L.Bean Waxed-Canvas Maine Hunting Shoe Your grandpa may have shot ducks in these boots, but they'll perform just as well at Whole Foods. The newly updated version of the 1912 classic hunter boasts a hand-stitched, waxed-canvas upper and a lifetime guarantee, so they only get better with age. Sorta like Grandpa. | \$129

88 Belkin Conserve Insight How much juice are you really saving with that CFL lava lamp? Find out and impress your dates even more! Belkin's Conserve Insight plugs in between your outlet and your gear, with an easy-to-read display that shows just how much juice your electronics are slurping down. | \$30







### **Ural Patrol T**

Never before have the words Russian knockoff fueled such lust. While original WWII-era BMW bikes look hot, vintage models are 75 years behind the engineering curve. The Patrol T pairs classic sidecar styling with modern amenities like two-wheel drive, off-road-ready suspension, and dual disc brakes. Added bonus: You're not buying Nazi surplus. | \$9,999

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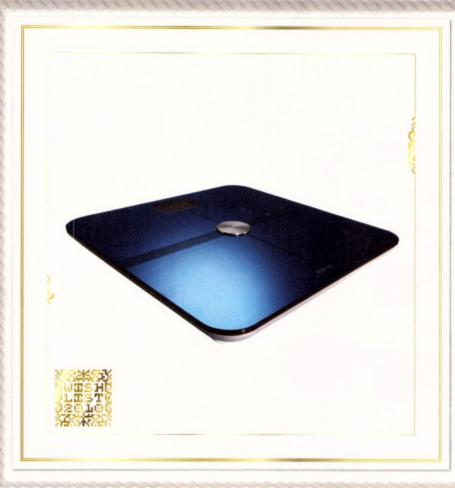
## SAMSUNG EPIC™ 4G

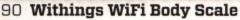
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93 Green Toys

Having kids means buying lots and lots of stuff,
including a truckload of
toys. But you can limit
the waste all that plastic
produces: Green Toys
offers kid classics, from
cutlery and tea sets
to blocks and trucks,
made from recycled
milk containers. So your
tyke can have her pretend cake and help the
planet, too. | From \$6



neuroscience to neuroscientists? This physiological rig amplifies neuronal spikes from biological specimens. Attach it to the dismem bered leg of an unsus-

94 Backyard Brains

SpikerBox Why leave

biological specimens. Attach it to the dismembered leg of an unsuspecting cockroach and listen to its neurons as an iPhone interface creates visualizations. Oh, and don't sweat the bug legs; they grow back! \$100



95 Freehands Gloves

When that hottie hipster flirts you up in line, don't be stuck blaring Teenage Dream because your iPod is as impervious to gloves as random encounters are to second chances. Bring the top 40 sans fear in these cashmere gloves with removable fingertips that allow for swiping, pinching, and skipping to Sleigh Bells. §80



Zorb Water Roller

Grab this floating hamster wheel and set out across the Pacific in your own low-rent Plastiki. Made from international-standard 0.8-mm thermoplastic polyurethane, it will stand up to rough waters and pointy things—though you probably shouldn't test that claim during Shark Week. | \$695



92 Longines Heritage Collection Legend

Diver After years of blinged-out luxury watches with oversize diamond-studded faces, the simplicity of the Legend Diver is a breath of fresh air. This model combines the vibe of airplane dials with an alligator strap and can go from formal to weekend with ease and aplomb. \$2,200



96 Apple TV

Cable TV is for sports and old people; we want limitless entertainment served up à la carte. Apple TV delivers premium HD—rentals from Apple and streams from Netflix—with no contractual handcuffs. Best yet, at just 13.7 cubic inches it won't AV-nerdup the den. Just don't lose it in the couch cushions. | \$99





directions to get you home while dinner's still warm. Now get back in that saddle! \$650



99 Lomography Spinner 360° Digital is delightful, but this film camera has one heck of a manual trick up its 35-mm sleeve. Pull the string attached to its base and the lens twirls to capture a full circle of action. The resulting photos' exaggerated perspective and exposed sprocket holes look both retro and futuristic. \$145





100 LaCie MosKeyTo

Just a few years ago, a portable 8-gig drive was the size of a pack of gum. Well, this one's the size of a Chiclet. That is, a Chiclet that can hold about 2,537 copies of Merriam-Webster's Pocket Dictionary. Just keep it away from the candy bowl lest you accidentally swallow your words. | \$28

Wild Science's Ant-O-Sphere

Wild Science's Ant-O-Sphere takes the ant farm into three dimensions. Plastic spheres and tubes serve as living chambers and tunnels; you provide food, soil, moss, and water (and ants, sold separately). With persistence and care, your colony will develop a hive mind and tend to its moss "garden," creating a selfregulating ecosystem with you as its god. Or so you can tell yourself. | \$50

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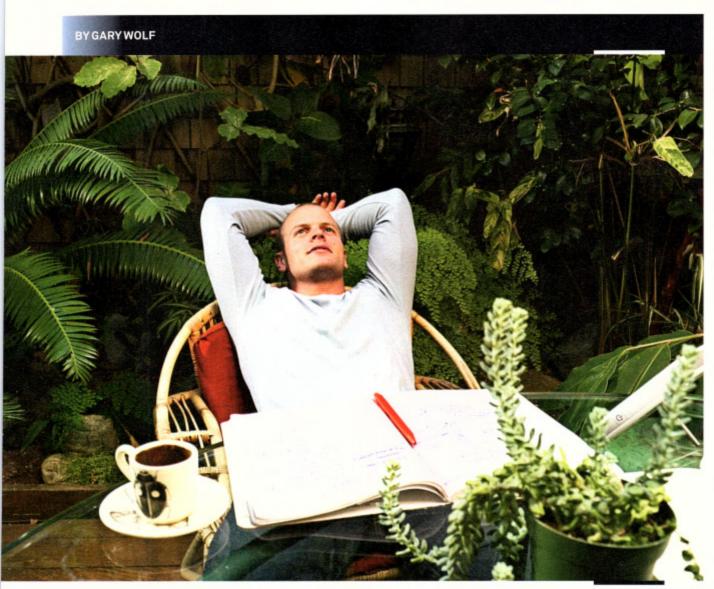


So keep snapping. Keep Going

now that's positivenergy

## THE BODY HACKER

Tim Ferriss told us how to optimize the workweek. Can he teach us how to max out our bodies, too?



Ferriss records his exercise and supplements in oversize notebooks.

IM FERRISS is a self-made lab rat. The author and entrepreneur has been subjecting himself

to audacious experiments in physical training and nutrition since high school. In perhaps the most extreme undertaking, he packed on 34 pounds of muscle while dropping 3 pounds of fat in 28 days. He recounts his adventures in a new book, The 4-Hour Body: An Uncommon Guide to Rapid Fat-Loss, Incredible Sex, and Becoming Superhuman, a title he reverse-engineered from data he collected from the clickstream and Twitterverse. ¶ The book is a sequel of sorts to his first book, The 4-Hour Workweek. Aimed at young men curious about wealth, leisure, and foreign travel, Workweek was rejected by some 26 pub-

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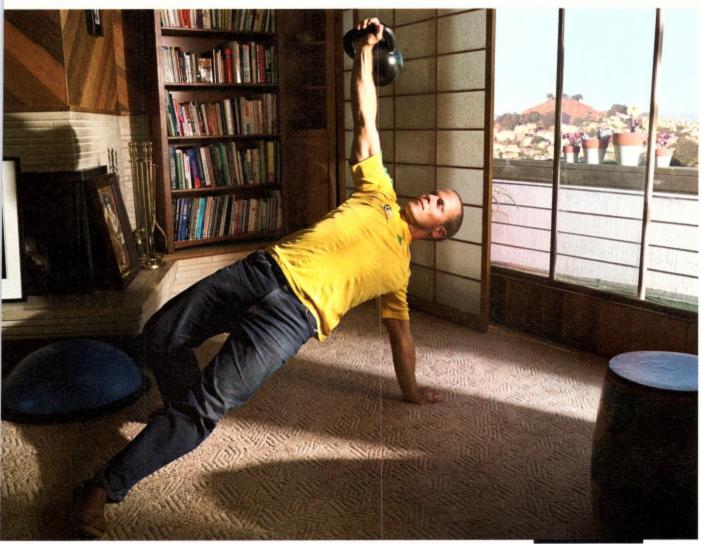
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A practitioner of yoga, Ferriss once won a national gold medal in kickboxing.

lishers before Crown took a chance on it. Its viral mix of anything-is-possible enthusiasm and practical productivity tips turned out to be the formula for a publishing phenomenon—it's still riding best-seller lists more than three years after it hit bookstores.

Now, in The 4-Hour Body, Ferriss, 33, turns to an entirely different set of keywords: weight loss, muscle gain, sperm count, and female orgasm. WIRED asked contributing editor Gary Wolf—cofounder of the Quantified Self, a blog about self-tracking and self-experimentation—to interrogate Ferriss about his history as an n-of-1 guinea pig, his experience with performance-enhancing drugs, and his faith in heretical recipes for radical self-improvement.

### When did you start experimenting on yourself?

When I was a competitive wrestler in high school, I was prone to overheating. So I had to find ways to dissipate heat. Manipulating hydration was really my starting point.

#### Did you diet a lot?

In my senior year, I cut from between 175 and 178 to 152 twice a week. I did it by pure dehydration. You have to be careful with that, because you can have organs fail if you go about it the wrong way. I don't recommend it.

How did you learn about these dark arts? I mean, you're a teenage wrestler. Did your coach clue you in? No, my only help came from other wrestlers who themselves had tested the methods of previous wrestlers. When you have good data, such as pound-per-hour loss rates, you can learn quickly through trial and error. I also read a lot about electrolyte balance. I wanted to find out what was just below the threshold of life-threatening.

#### How far did you take it?

By the time I was 21, I had refined the approach, and I was using diuretics as well. Icut about 20 pounds to compete in the kick-boxing nationals; then, after weighing in, I hyper-hydrated. I weighed in at 165, and the next day I stepped onto the platform at

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## There's an entire generation of male athletes who have never gotten off the ephedrine-caffeine-aspirin stack.

193. It was pretty funny. My first opponent stepped onto the mat and started looking around because he thought he was on the wrong platform. He was like, this can't be right! I won a gold medal.

#### Diuretics aren't banned?

Yes, in many cases they are. Not only because of their weight-loss effects but also because they can mask other drugs. In any event, at the higher levels of athletics this sort of thing is the rule rather than the exception. In any sport where power, speed, or endurance is a determining factor, everyone is using drugs.

You got your start with this stuff in the '90s, just as the shadow world of performance-enhancing drugs seemed to be hitting the mainstream. It looks like you were able to stand on the border of those two worlds.

There are a lot of things that can be learned from the darker corners of athletics. You have doctors who view bodybuilders as cavalier amateurs of science. And then you have the bodybuilders who view the doctors as too conservative to do anything interesting. So I've tried to become the middleman for putting some of those pieces together.

## Aside from the diuretics, what were you into in those days?

The cocktail that I began experimenting with was ephedrine plus caffeine plus aspirin. Basically, you're hitting the accelerator.

#### These are all over-the-counter drugs.

Ephedrine was for a long time. But people were using it to manufacture methamphetamine, so they started blending it with other drugs to make that harder to do. But I don't recommend it anyway. There's an entire generation of male strength and endurance athletes, even recreational lifters, who have never gotten off the ephedrine-caffeine-aspirin stack. The process of getting off stimulants is really horrible. I'm more cautious now. Hey, um [pulling a bottle of pills and a plastic pouch of fine powder from a paper bag], I brought you some goodies. I don't

know what the law is governing these, so let's say I'm giving them to you for visual reference only.

#### OK, right.

God knows I don't want to be accused of "intent to distribute."

[Examining the bottle.] Good old piracetam. I wrote about these so-called smart drugs in the early '90s. I'm still skeptical.

The pouch is micronized resveratrol, which you can't buy over the counter.

#### Where did you get it?

I got it directly from the manufacturer. Resveratrol is fascinating stuff. One of the best sources of information about it is the Immortality Institute. They have a forum where some people are in the 500 Club, as they call it. They've been taking 500 milligrams for years. It's a really great source of data.

#### Do you take it?

Not anymore. There's anecdotal reports of joint pain, and I ended up having incredible pain in my elbows and lesser pain in my knees.

### What do you think is the most dangerous experiment that you tried for *The* 4-Hour Body?

I had a chemical cocktail injected to reverse injuries. It included BMP, bone morphogenetic protein, and there's a risk of it fusing your vertebrae. In retrospect, I probably wouldn't have included that.

### There's a long section on sexual performance in the new book, where you get hands-on instruction on what you call "facilitating" female orgasm. Why did you want to include this?

This book is entirely a product of polling and asking people what they want to learn about. When you try to find out about female orgasm, you get into a lot of misinformation really quickly. Separating fact from fiction is really hard. So I figured, why not just do the tests? Sex is so key to quality of life. The way it's discussed is always vague because



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## Always safe.

## In the Lab With **Tim Ferriss**

The 4-Hour Body is a lab report on more than a decade of diet, exercise, and sexual trials that Tim Ferriss carried out on himself. Here are some highlights. —Angela Watercutter

#### EXPERIMENT

BEEF OUT

To test the effect of cholesterol consumption on his lipid profile, Ferriss adopted a diet that pro-vided almost 100 percent of his calories from beef and mixed nuts for

#### CHALLENGE

Eating 2 to 4 pounds of grassfed meat per day.

#### OUTCOME

terol levels. It also helped triple his tes-tosterone level.

MUSCLE UP

into muscle instead of fat, he spent 28 days try-ing to put on as much

Methodically measuring his feces volume to test how well his nutritional supplements were working.

Ferriss gained 34 pounds of lean muscle and lost 3 pounds of flab in four weeks, dropping his total body fat percentage from 16.72 to 12.23.

**TEST BLOOD** 

To determine which meals were likely to add body fat and to assess the optimal timing for food intake around athletic activities, he had a device implanted in his side that tracked his blood glucose for three to four weeks.

The protruding sensor made it hard to shower. He also had to prick his fingers 20 to 30 times a day to draw blood for parallel tests to verify the device's

insight. For exam-ple, it's best to have a "post-workout" shake

REVERSE INJURIES

previous 13 years—effec-tively restoring his body to that of a 20-year

A "stupid and completely avoidable' staph infection in his elbow, caused by a botched injection,

It took longer than expected, but after six months, he actually reversed the effects of all his major injuries. Most of the benefit came from physical therapy, not drugs.

To find a precise and replicable method for generating orgasms in women, he enlisted the help of tantric specialists, "sex commune" instructors, and porn stars, among others.

Finding enough willing subjects to adequately test his

fieldwork, he hit on a technique capable of lasting up to 15 minutes. He says that it's effective more than

we live in a puritanical society. I mean, they won't show nipples in advertisements, so they're definitely not going to talk about the anatomy of the clitoris.

#### There's a shortage of sex advice?

I think most of the sexual advice out there is bullshit. It's based on a book that was influenced by a book that was influenced by a book. There's no testing. The sex is right in the subtitle of my book, and most people jump right to that section.

## Speaking of testing, I assume you market-tested the title of the book?

Oh yeah, with about 4,000 people, in three separate rounds. Testing is how I ended up with the title of *The 4-Hour Workweek* as well. That was one of about 12 titles I tested using Google AdWords. Ibid on keywords or phrases associated with the book content, like "world travel," "401K," etc. And then the ads that were displayed had the title of

#### like that, I say, "Bullshit."

I'd respond the same way. And it's going to be shelved between *The Five-Minute Solution* and—whatever—*The Four-Week Solution*.

Right. I have a book I bought out of perverse admiration called *The One Minute Father*. I thought, I need to have that book around just to use it as an example of things I hate. But *The 4-Hour Body* actually isn't like that. It's a big, thick book full of nonobvious advice, written by somebody who's been on a dangerous mission of self-discovery. I'm not necessarily going to follow your advice, but I'm interested in what you've discovered.

Look, the titles are just about getting people's attention. Whether they say, "Wow, that sounds really interesting," or "That guy's full of shit"—as long as they pick up the book or click on the link, I don't care.

## Most sexual advice is bullshit. It's based on a book that was influenced by a book. There's no testing.

the book as the headline and the subtitle as the ad text. And then I just looked at the clickthrough rates.

## What was on the pages when people clicked through?

Nothing-just "under construction."

I have to tell you, The 4-Hour Workweek did nothing to reduce my workweek. In fact, I took the title as pure provocation. You know, if you'd said, "Improve your work efficiency by reducing the time you spend on email," OK, that's more plausible if less interesting. I read the book. I still work a lot.

The basic premise was gaining control of your time so that you can reduce your hours to a volume that you want. For most people, life would be boring without meaningful work.

I see the same thing in *The 4-Hour Body*. Lots of people want to become superhuman without putting in any effort. To be honest, when I see a title

You discuss polyphasic sleep: Rather than sleeping six to nine hours at a time, we're supposed to take, like, 20-minute naps every four hours. Do you really think this works?

I have never been able to do with less than six hours a day for more than four weeks. But I know several tech CEOs who have used similar schedules for approximately a year before social needs intervened.

### One of your footnotes points to an analysis that debunks polyphasic sleep. So, what's your bottom line?

One of my goals is to catalyze an army of good self-experimenters; part of my job is therefore to train readers to do their own homework. Richard Feynman famously remarked, "It doesn't matter how beautiful your theory is, it doesn't matter how smart you are. If it doesn't agree with experiment, it's wrong."

Contributing editor GARY WOLF (gary @aether.com) wrote about the first computer in issue 18.11.



Always safe.







## MAY THE BEST NERD WIN

Kids from all over the world do battle at the algorithm olympics.

Gold medals awarded at the International Olympiad in Informatics (1999-2009)



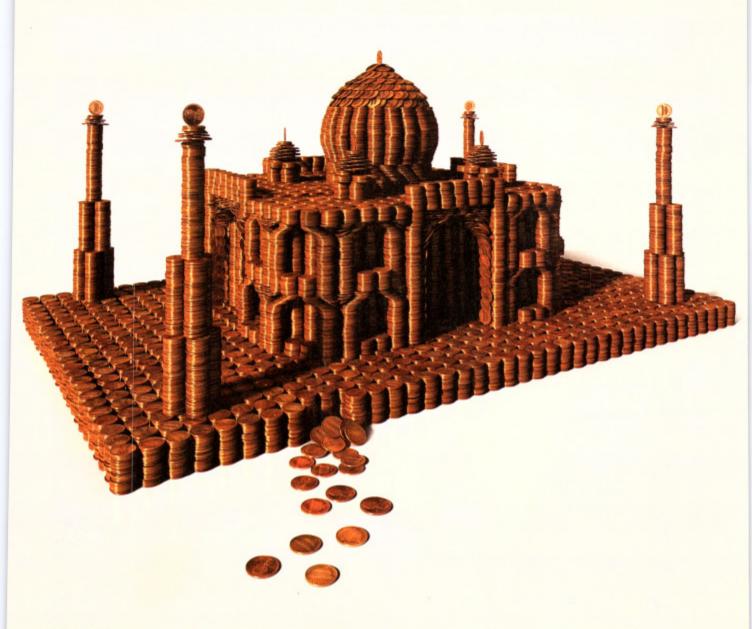






EAL WU'S LAST CHANCE for international glory, and maybe America's, too, begins with a sound like a hippo crunching through a field of dry leaves—the

sound of 315 computer prodigies at 315 workstations ripping into 315 gray envelopes in unison. "You have five hours," a voice booms across the packed gymnasium. "Good luck." ¶At his desk on the gym floor, Wu, age 18, pushes his glasses up on his nose and squints. He shouldn't need luck. This is a coding competition—the International Olympiad in Informatics, held in August at the University of Waterloo in Ontario, Canada—and Wu is one of the world's top competition programmers. ¶He just graduated from Baton Rouge Magnet High School in Louisiana; his parents are chemical engineers originally from Shanghai, although Wu was born in the US. In seventh grade,





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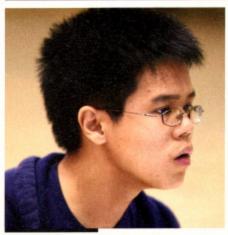
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he took first place in a nationwide contest for middle schoolers called Mathcounts. (There's a Neal Wu fan club on Facebook that celebrates his "awesome math skills.") Yet according to Rob Kolstad, the US team's 57-year-old head coach, Wu is merely "very good" at math. His true gift is for creative problem-solving with code. In 2008, the first year he competed at the IOI, he finished 10th out of 300 contestants. In 2009, he moved up to seventh place. Since then, he has competed in six coding contests run by Kolstad's organization, the USA Computing Olympiad; he won three of them with perfect scores. Wu has the relaxed disposition of a star athlete; he's confident without ever letting on that he is America's Great Nerd Hope. "I hate to say he's the Tiger Woods of computer programming," Kolstad says, "but he shares the properties of cool, calm under pressure, and consistent, consistent performance."

Cool or no, there are a lot of expectations on Wu as he shuffles through the contents of his gray envelope. Four stapled packets

of paper. Four word problems designed to test programming prowess-specifically, the ability to crunch incredibly huge and complex data sets in seconds. For each problem, Wu first has to choose an algorithm, or series of computational steps. Then he has to code it. Wu's coaches have drilled into his brain 16 standard algorithms with names like Two-Dimensional Convex Hull, Greedy, Eulerian Path, and Knapsack-an arsenal of mathematical machetes for hacking through thickets of numbers-and in Wu's years of coding he has flexed and massaged the algorithms into no fewer than 100 subtle variations. But what makes IOI so difficult, unpredictable, and yes, even dramatic is that competitors like Wu may have to invent and code their own ad hoc algorithms on the





Clockwise from top left: A printout of the Maze problem; Gennady Korotkevich of Belarus; work in progress on Maze; American Neal Wu.





spot. One-of-a-kind solutions to one-of-a-kind problems. From scratch. In five hours.

It's grueling work, so Wu starts out slowly. He flips through the problem sheets, scribbling an occasional note with his mechanical pencil. The dominant sound in the gym changes from the shuffling of paper to the clacking of keys, but Wu resists the urge to type right out of the gate. "Typing is hypnotic," Kolstad says emphatically. "When you're typing, you're not solving problems."

But Wu's nemesis, the Boy Wonder of Belarus, does not subscribe to this theory.

A tall kid with skinny arms, short brown hair, and a bashful smile, Gennady Korotkevich started competing at IOI when he was 11. When Wu was 11, he didn't even know about programming. At last year's IOI in Bulgaria, Korotkevich upset Wu and everyone else to take first place, becoming the youngest winner in the contest's 20-year history. This year Korotkevich is back again, at the ripe age of 15, looking to deprive Wu of his last shot at winning IOI. Next year Wu will be in college and therefore ineligible.

Their styles couldn't be more different. While Wu is relaxed and thoughtful, Korotkevich is a jackrabbit. "My parents are programmers, and now I like it as well," he says in tentative English. Unlike the sociable Wu (who interned at Facebook last summer), Korotkevich squirms when I talk to him about his abilities, insisting he's nothing special. At IOI, he sticks close to his Belarus teammates and coaches. The gossip at IOI is 40 percent about the word problems, 10 percent about which country's coaches have the best liquor (Canada, hands down), and 50 percent about Gennady Korotkevich.



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Ask the kids who's going to win this year and regardless of whether they're Kazakh or Japanese, Swiss or Egyptian, they'll invariably grunt, "Belarus, Belarus." And then they'll start laughing, as if to say, haven't you been paying attention?

This morning, Korotkevich began typing five minutes and 40 seconds after the competition began. Like several of the elite competitors at IOI, he can code as fast as he can touch-type. Three minutes later, Korotkevich completed his first program: a mere 22 lines of Pascal.

The three approved IOI programming languages are Pascal, C, and C++. The Western kids, including Wu, tend to use C++, the most modern and streamlined of the three. But Pascal still has a following in Eastern Europe and Asia, even though coding in it is like "building a car with just a screwdriver and a wrench," says Troy Vasiga, this year's IOI chair.

Korotkevich uploads his Pascal code to a network of 10 Linux machines running a set of grading programs. Appropriately, there are no human graders at IOI; instead, robots provide immediate results, which in 2010 were posted for the first time on a live online scoreboard. A few seconds after Korotkevich submits a solution, his program receives a perfect 100 and the scoreboard shows him in first place.

At the 20-minute mark, Korotkevich posts a perfect score on his second problem, going up 200 points on Wu.

Meanwhile, Wu picks up his mechanical pencil, clicks the lead a couple of times, puts it back down. He likes to alternate between a mechanical pencil and a pen, drawing graph axes in ink and labeling the vertices in pencil, which allows him to erase if he wants to backtrack. He's still thinking, still strategizing. He has yet to write a single line of code.

At the one-hour mark, Korotkevich runs his score up to 255. He's cruising now.

Wu, a smallish kid with black hair that is less unkempt than that of your ordinary nerd, cranes his neck and glances around the gym, taking in the scene: kids from 83 countries, their desks arranged in cloverleaf clusters of four, looking—despite their races and nationalities—

## ONE MURDER, TWO SOLUTIONS

Competitors at the 2010 International Olympiad in Informatics tackled eight programming problems in two days of competition. Here's one of the simpler challenges, along with the solutions supplied by Gennady Korotkevich and Neal Wu. Of the 315 competitors, 269 received a perfect score.

**THE TASK:** Dr. Black has been murdered. Detective Jill must determine the murderer, crime scene, and weapon. There are six possible murderers (numbered 1 through 6, Professor Plum to Mrs. Peacock), 10 locations (1 through 10, ballroom to cellar), and six weapons (1 through 6, lead pipe to spanner). Detective Jill tries to guess the correct combination (there are 360 possibilities). Each guess is a theory. She asks her assistant, Jack, to confirm or refute each theory. When Jack refutes a theory, he reports that one of the guesses—murderer, location, or weapon—is wrong. The contestants are tasked with implementing a procedure that plays the role of Detective Jill. A brute-force program that tests all 360 theories earns a mere 50 points. An efficient program that tests no more than 20 theories earns an additional 50.

korotkevich's solution: Clearheaded and sleek. He sets up three variables, x, y, and z, to represent the murderers, locations, and weapons, respectively. Then he systematically tries all the combinations in order, increasing the variables incrementally. In other words, if his first theory is 1, 1, 1 and the computer tells him that the location is incorrect, his next theory is 1, 2, 1. This is efficient because all he has to do is keep track of which murderer, which location, and which weapon to try next. That's just three things to remember.

Language: Pascal Lines of code: 22

```
#include "grader.h"
#include "cluedo.h"
const static int M = 6, L = 10, W = 6;
bool mur [M], loc [L], wep [W];
void Solve ()
     for (int i = 0; i < M; i++)
          mur [i] - true;
     for (int i = 0; i < L; i++)
          loc [i] = true;
    for (int 1 = 0; 1 < W; 1++)
wep [i] = true;
     int result = -1;
    while (result != 0)
          for (int i = 0; i < M; i++)
               if (loc [i])
          for (int i = 0; i < W; i++)
if (wep [i])
w = i;
          result = Theory (m + 1, 1 + 1, w + 1);
          if (result == 1)
          mur [m] = false;
else if (result == 2)
         loc [1] = false;
else if (result == 3)
wep [w] = false;
```

wu's solution: Successful but more complicated than necessary. Wu first sets up a master list of all murderers, locations, and weapons. To do this, he creates three arrays called, naturally, mur, loc, and wep. Then he loops through the arrays, crossing off incorrect guesses as he goes. Each time he forms a theory, he searches all three lists to find a murderer, a place, and a weapon that hasn't been crossed off.

Language: C++ Lines of code: 46

like members of the same tribe. Many are wearing the black Google T-shirt that was stuffed into their IOI schwag bag, and most of the rest are decked out in teamissue polos or T-shirts from prior competitions. (Notable exceptions: the three young women in head scarves representing Team Libya.) Korotkevich is out there somewhere, a mysterious wraith in a blue pullover. Wu has no idea how well his rival is doing-during each competition period, the kids can see only their own scores-but the contest organizers certainly know. They're up in the gym balcony, tracking the live scoreboard on their laptops. And it looks pretty bad. Wu is not even on the board yet. This is a slaughter in the making.

And then, 70 minutes into the competition, Wu places his fingers on the keyboard.

COMPETITIVE PROGRAMMING may strike you as history's worst idea for a sportshuffleboard minus the bracing speed, the Scripps National Spelling Bee without the adorableness. In fact, battle-coding is a surprisingly popular global pastime, indulged in by thousands of high-school and middle-school programming clubs and turbocharged by websites like TopCoder, a sort of social networking and gaming site for algorithm nuts. At TopCoder, kids and adults alike battle one another to solve IOIstyle problems for cash prizes. Member ID neal\_wu shows up in red, signifying elite status. To get your name in this color, you need a TopCoder rating of 2,200 or better. To become a "target"—the elite of the elite you need at least 3,000. Wu's rating is 3,248, making him number six in the world. (Korotkevich also has a TopCoder handle, tourist, and is ranked number five.)

As if TopCoder weren't enough, many of the national programming teams host their own sites, where they post sample problems and practice exams. The USA Computing Olympiad site is run by Kolstad, who also holds a weeklong camp every year for 15 elite American coders-at the end of that week, the four-person IOI team is selected. With his thick shoulders and deep bellowing voice, Kolstad seems more like a football coach than a computer guy. "I don't know how to do most of the algorithms," he says. He prefers to focus on mental preparation and attitude: "Just like Vince Lombardi, who, of course, didn't play football on the field with his players."

The Training Pages section of USACO.org is open to coders from all countries, but Kolstad says it's dominated by the Chinese, who have been commanding the team portion of IOI for as long as anyone can remember ("n large years," in IOI-speak). They also dominate the International Collegiate Programming Contests. In February, a team from China's Shanghai Jiaotong University won the ICPC world championship in a stroll, while several American universities tied with 16 other countries and foreign universities for 14th place. The trend is the same in both contests: Western decline, Eastern ascendance. Since international collegiate coding competitions began in 1977, US universities won the first 13 ICPC contests in a row and went on to earn four titles in the 1990s; the 1993 champion squad from Harvard included a young Tony Hsieh, now CEO of Zappos. But the last American victory came in 1997, and since then the contest has been ruled by Russia, China, and Poland. "We're getting outtrained," Kolstad laments.

China's approach to IOI is proof of just how serious the contest has become and how tied up it is in notions of national prestige and economic competitiveness. To earn a spot on the Chinese team, a coder has to beat 80,000 of his compatriots in a series of provincial elimination rounds that last an entire year. Then he-the competitors are almost all male—has to sit on a stage in front of hundreds of onlookers and answer questions in English like "How will you show the traditional culture of China to the foreign friends?" says Yi Wu, a member of China's team. China is an extreme example, but pretty much every kid roaming the Waterloo campus this week has beaten hundreds or thousands of countrymen just to get here. Even the losers are brilliant.

Universities and corporations have taken notice, treating the IOI-competitive programming's crowning event—as the equiv-

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alent of the NFL Scouting Combine. This year's primary sponsor is BlackBerry maker Research in Motion, whose CTO spoke at yesterday's glitzy opening ceremony featuring the Waterloo Warriors cheerleading squad. Other sponsors include Lenovo, IBM, Amazon.com, and Google. It's understandable that so many tech companies would want to nurture IOI: Google is famously built atop an algorithm called PageRank; Twitter's "Who to Follow" feature is a set of algorithms; Amazon's entire site, from sales rank to product recommendations, is a system of interlocking algorithms. IOI may be an academic competition, but its purpose is to advance a discipline that has driven the growth of the Internet and turned geeks into billionaires. Here in Waterloo, what's at stake for the kids is a college scholarship, but what's at stake for the industry is something larger: the ability to keep innovating new algorithms to make sense of an increasingly complex world.

The organizers of IOI, acknowledging this happy nexus, have decided this year to sneak a few problems with real-world applications into the coders' gray envelopes, particularly one called Languages.

By the time Wu gets to Languages, around the 90-minute mark on the first day of competition, he has already made up much of the ground he lost to Korotkevich, posting two perfect scores on the two easiest problems within seven minutes of each other. Now he's got three and a half hours to crack Languages. Good thing, because it's a hell of a curveball: Given 10,000 text strings selected from random Wikipedia articles written in various human languages, create a program that identifies the language. The competition's science director, Gordon Cormack, threw Languages into the mix out of sheer curiosity; he genuinely didn't know what the best answer was and hoped the kids would show him. Now they have: Wu's 227-line program analyzes the frequency of each letter in the string (English has fewer ks and zs than, say, Czech), narrowing the possible tongues to a handful, then refining the guess by breaking the string into four-letter chunks and analyzing the frequency of the chunks. With this strategy, Wu can distinguish 56 languages, everything from Azerbaijani to

Vietnamese, 85 percent of the time.

Wu finishes the day in seventh place, followed by his three US teammates: Michael Cohen, an energetic, curly-haired Elijah Wood look-alike and the son of a physics professor; Wenyu Cao, from the prestigious Phillips Academy in Andover, Massachusetts; and Brian "Hamster" Hamrick, from Thomas Jefferson High School for Science and Technology in Virginia. (Kolstad and the kids joke that the US team boasts "two and a half Asians," with Wu and Cao as the two and "Hamster," whose father is Caucasian, as the half.) They're no slouches: This summer, Cao studied advanced math at MIT and Cohen studied physics at the University of Maryland. All except Hamrick will begin day two within striking distance of becoming the overall winner. In fact, their performances are good enough to push the US into a virtual tie with China-a shock even to Kolstad.

The coach is giddy at the chance to bring attention to the American coding program. The only kid returning next year is Cao, so Kolstad will have to recruit a new team to carry the torch, on top of securing new funding, as he does every year. (Team USA is itself an ad hoc hack; one of its main sponsor, for some reason, is IBM Canada.) Nothing could make Kolstad's job easier than a splashy rout of China.

As for the Boy Wonder from Belarus, he wraps up the day in first place, 11 points ahead of Wu. He submitted 400 lines of tight, efficient code and held the lead almost the entire five hours. Once or twice, when an opponent from Bulgaria or Singapore overtook him, it was almost like he could "sense the scoreboard," as Kolstad puts it. Then he'd shoot back to the top. The day's events have dealt a fatal blow to the theory that Korotkevich is a mere coding robot, an uncreative automaton; if it were true, Languages would have fried his circuits. But he aced it, achieving slightly higher than 90 percent accuracy. "It was interesting, actually," Korotkevich tells me when I stop him on the steps of the gym, his hands clasped behind his back and eyes darting from side to side like a panicked squirrel. "I am not used, quite, to such problems." He tells me that the rumors are untrue: He practices only

## If Korotkevich were a mere coding robot, the Languages problem would have fried his circuits.

three to four hours a day, not six to seven.

There's nothing to do now but wait for the second and final day of competition. Some of the English-speaking kids pass the time with an afternoon game, their version of Taboo. At a long table in a dining hall, each competitor writes down four nouns on slips of paper, crumples them up, and tosses them into a hat. The kids will have to guess the words from verbal clues. The hat fills with words to warm a coder's heart: bubble sort, polynomial, integration. Also czar, Lakers (a tricky one for this crowd), serial killer, and scandalously, a word whose clue is given as "a way of showing affection with your tongue."

"French kiss," Wu guesses correctly as the table explodes into giggles.

EVERY YEAR AT 101, there's a question so difficult that it humbles even the adults who try to crack it. This year, that question comes on day two. Called SaveIt, it's a classic ad hoc problem, not solvable with any standard algorithm. SaveIt asks the coder to calculate a table of the shortest distances through a large transportation network consisting of 1,000 cities and 36 hubs. Then, to get the full 100 points, the coder has to cram that table into an incredibly small space and decompress it without losing any information. It's as if someone gave you an inflated beach ball and said, here, pack this into a cookie jar. If you find the air nozzle, it's simple. Otherwise, it's impossible.

At IOI, if you don't get full points on a program, you're allowed to tweak it and resubmit it, which means that with most IOI problems you can start off with a rough approach, a kludgy halfway solution, and optimize it as you go. But you can't do that with SaveIt. If the key insight eludes youif you don't grasp how the transportation network can be represented with 1s and 0s (the integers, not binary code) and therefore compressed quite easily-you'll spend hours bashing your head against your desk. Cormack, the science director, tells me that he anticipates SaveIt will stump the vast majority of the kids. No more than 10 of them will get the full 100 points, he predicts, and it will take the whole five hours.

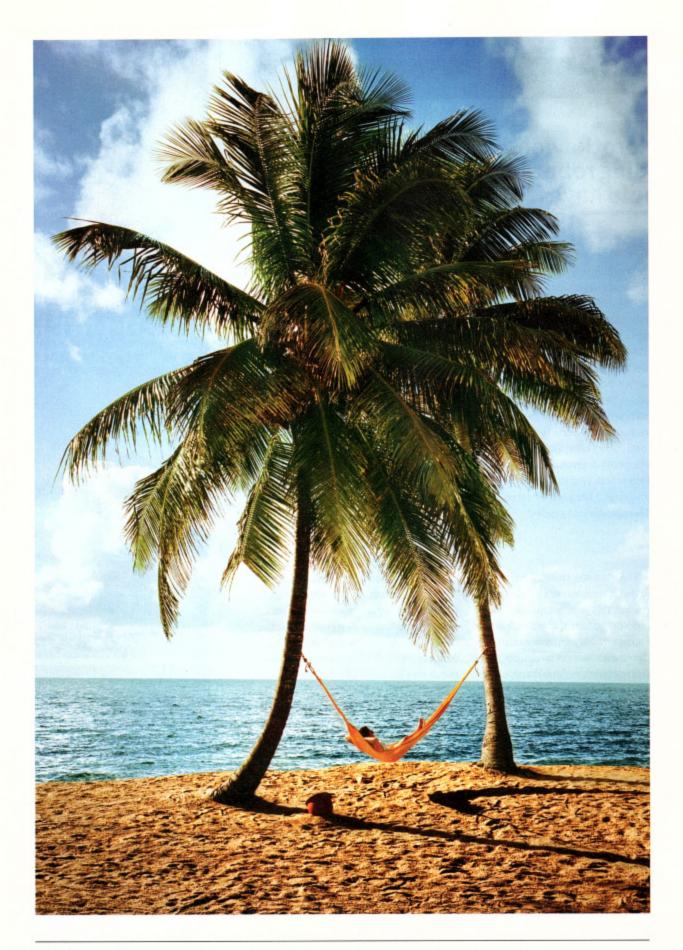
Wu, wearing a Facebook T-shirt, denim shorts, and running shoes, rips into his gray envelope. As on day one, he pages through the tasks with gentle, unhurried motions. When he gets to SaveIt, he thinks about it for a while, then puts it down and decides to start on the day's other hard problem instead, called Maze, whose difficulty is more like climbing a ladder than a sheer rock face. Maze requires the coder to draw a series of mazes of various sizes and complexities. A riff on a classic unsolved question in computer science, it's a type of problem called NP-complete, meaning that it's possible to find a good-enough solution with a combination of creativity and moderate computing power, but to find the best possible solution could take trillions of years. The first couple of mazes are small enough to create by hand, but as they get more labyrinthine, the kids have to write code to generate them.

Meanwhile, Korotkevich starts on the two easiest problems, called Memory and Traffic. He solves Memory within five minutes and Traffic within 19, and by the 90-minute mark, he earns partial scores on Maze and SaveIt.

Wu is off to a characteristically slow start, posting a measly 18 points to Korotkevich's 274. (He submitted an incomplete version of Maze to make sure he was on the right track; if he weren't, he would have gotten 0 points rather than 18.)

Up in the gym's balcony, a Dutch technology entrepreneur named Kim Schrijvers is doing ESPN-style color commentary on a live web feed. He notices the gap between Wu and Korotkevich. "Is Neal toying with us?" Schrijvers asks.





Rob Howard for Town and Country

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Itake a walk, get a cup of coffee, come back, reload the scoreboard. No change. Wu in 272nd place; Korotkevich in first. Two hours left. Over on his patch of gymnasium floor, the Boy Wonder from Belarus allows himself a slight display of emotion. He smiles. Cormack rushes up to me in the balcony.

"Gennady got SaveIt, he got it," Cormack says, making a noise like he just coughed milk through his nose. "Wasn't hard enough! He got it with two hours to go. Amazing." It's not only the speed that impresses Cormack—it's the fact that Korotkevich used a sophisticated compression technique known as arithmetic coding, one that requires graduate-student-level chops. I ask Cormack if he's surprised to see a 15-year-old

A few more points on Maze push Cao up to fourth place.

"You have exactly five minutes."

"It's the desperate time," Schrijvers says. After all his banging away on Maze, submitting his answers nine separate times, Wu has entered the top 15. But his SaveIt program is still getting only 50 points out of 100. With three minutes left, he makes a final SaveIt submission: 370 lines of C++. He clicks to reveal his score: still just 50 points ...

"Time is up."

Wu slowly threads his toothpick arms through the straps of his backpack. As the gym empties, he lingers at his computer, staring at the screen, as if he can't quite believe what just happened. He still doesn't Amid the jubilation, one of the US coaches nods to Wu: Nice job, man. "Aaaaaahhh," Wu mutters dismissively. He'll have none of it.

Someone spots Korotkevich. The organizers crowd around him, patting him on the back, congratulating him on his second straight win. Kolstad watches Korotkevich quail from the attention and shakes his head. "He was ahead for 98 percent of the competition. The question is," Kolstad says slowly and with utter gravity, "will he die a virgin?"

At the closing ceremonies two days later, the medalists clamber one by one onto a banquet-hall stage for grip-and-grins with various dignitaries. All are male except for a lone, pale-skinned girl from Poland. Wu claps for silver medalist Hamrick and his

fellow gold medalists Cohen and Cao.

I catch Korotkevich sneaking a look at himself in a mirror before his big moment. As he hoists the enormous Lucite winner's trophy, his frail shoulders nearly buckle from the weight. His grin is epic.

Afterward, a slightly bummed Wu flies home to Baton Rouge to start packing for his next adventure: freshman year at Harvard. A month later, I give him a call to see how he's doing. He tells me he's taking four classes: Expository Writing, Chinese, Math 55 (a course so infamously punishing that it has its own Wikipedia entry), and CompSci 226, a graduate-level class taught by Michael O. Rabin. (Yes, the Michael O. Rabin, Turing Award recipient and cocreator of the Rabin-Karp string-hashing algorithm.) Wu reports he is the only freshman in the class, and he says that his algorithm knowledge is progressing to "way-more-advanced theoretical things" than IOI contests tend to cover, including "ridiculous" new types of functions.

Wu is toying with the idea of joining the table-tennis club. He has also met with the coaches at the Harvard Computing Contest Club, which sends two teams to the International Collegiate Programming Contest every year. For kicks, he took the tryout test for Harvard's team. He came in first place.

JASON FAGONE (@jfagone) writes for GQ and Philadelphia magazines and is working on a book about the future of cars.

## Cao makes a tweak, compiles his program. Segmentation fault. Crap. Something's off ... half an hour left.

who knows arithmetic coding: "It would be foolish of us to say that we are surprised by anything that Gennady does."

Wu can still catch up, but he's got to hurry. With an hour to go, he's stuck in 23rd place, struggling with SaveIt. The flash of insight hasn't hit him. His teammates are having more luck, though: Cohen posts a perfect score on SaveIt and shoots up to fourth place, and Cao thinks he's almost there. He makes a tweak, compiles his program. Error. Segmentation fault. Crap. Something's off with his variables ... Half an hour left.

"It is quite amazing," says Vasiga, the contest chair, "how time pressure focuses the mind in terms of optimization. Now is crunch time, when all the neurons are firing and fingers are starting to go at light speed."

Cao changes an n to an h, and his SaveIt program suddenly runs. He submits it, and the next time the web scoreboard updates, it shows—with 23 minutes left!—Cohen in fourth place and Cao in fifth.

"You have exactly 15 minutes remaining," the contest emcee booms. know how he did in relation to everyone else, but he knows that he underperformed in his last IOI. The unflappable Tiger Woods of computer programming looks dazed.

Schrijvers and his play-by-play crew roam the gym with a video camera, capturing footage for the live feed. They spot Wu and stick a laptop in his face so they can record his reaction as he learns the final standings.

"So this is you, Neal," Schrijvers says, pointing to the web scoreboard. "You are in 13th place." The top 25 are all considered gold medalists, but that result still stings. Wu looks away and purses his lips, clearly disgusted with himself.

Meanwhile, Kolstad enters the gym, beaming. "Troy, guess what?" he booms at Vasiga. "We won your contest!" Cao and Cohen held on to fourth and fifth places, and "Hamster" Hamrick was 43rd for a silver medal. That was good enough for the Americans to pull off a stunning upset, beating China. They're the new world champions.

"This is absolutely, absolutely brilliant," Schrijvers says.

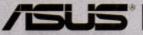


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Multifunction in metal: A daredevil's dream, the new Edifice from Casio marries form and physics with its advanced technology and dynamic design. It's built for speed, for smarts, and for style. The cool metal body reveals 3D layers of double disk hands and Casio's proprietary LSI technologies that deliver exacting quality and performance.

Racing is all about speed, split-second calculations, and taking a line. Made for men who value the moment, the Edifice is a complex machine that delivers agility, intensity, and reliability in one sleek powerhouse of a package.



**SELF-CHARGING SOLAR POWERED** Solar power combined with a large-capacity rechargeable battery enables these impressive solar timepieces to run smoothly under any light with no battery replacement.



SELF-ADJUSTING ATOMIC TIMEKEEPING Multi-Band 6 technology receives time calibration signals automatically from several transmitters around the world. This technology adjusts for leap year and daylight saving time.





MILLISPEED The 1/1000-second analog stopwatch relies on precise calculations of the weight and shape of its aluminum disk hand to supply precise measurements and ultimate accuracy.



MASTER TASKER Casio's proprietary LSI technologies operate five distinct motors independently, bestowing unprecedented multifunctionality and unrestricted control of each hand.



SPIN CYCLE Dual disk dials rotate, actually resembling your wheels, with speedy stopwatch action.

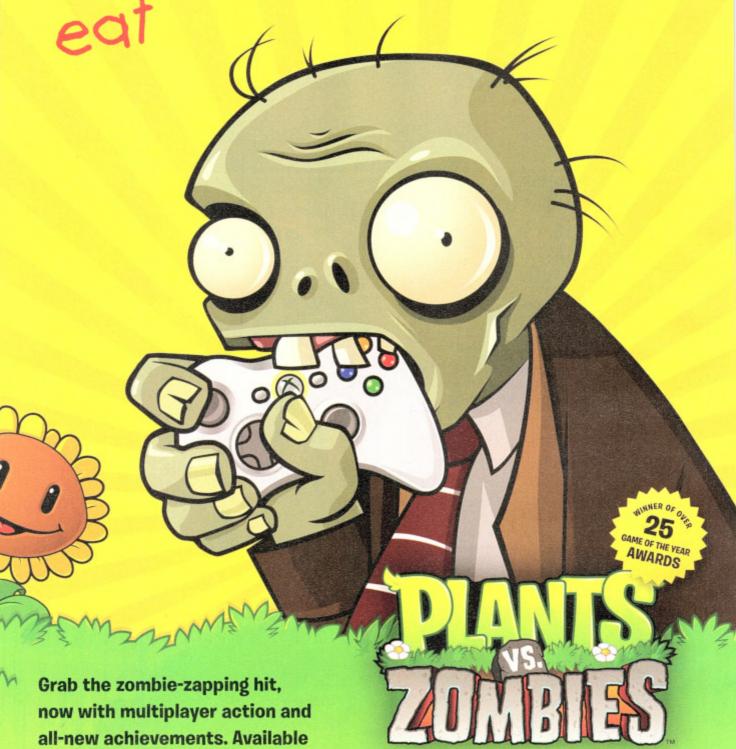


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Meet your new favorite game.



on XBLA and at local retailers.

Also for PC/Mac, iPhone and iPad. And coming soon for Nintendo DS! For Xbox 360° and **Xbox LIVE** Arcade



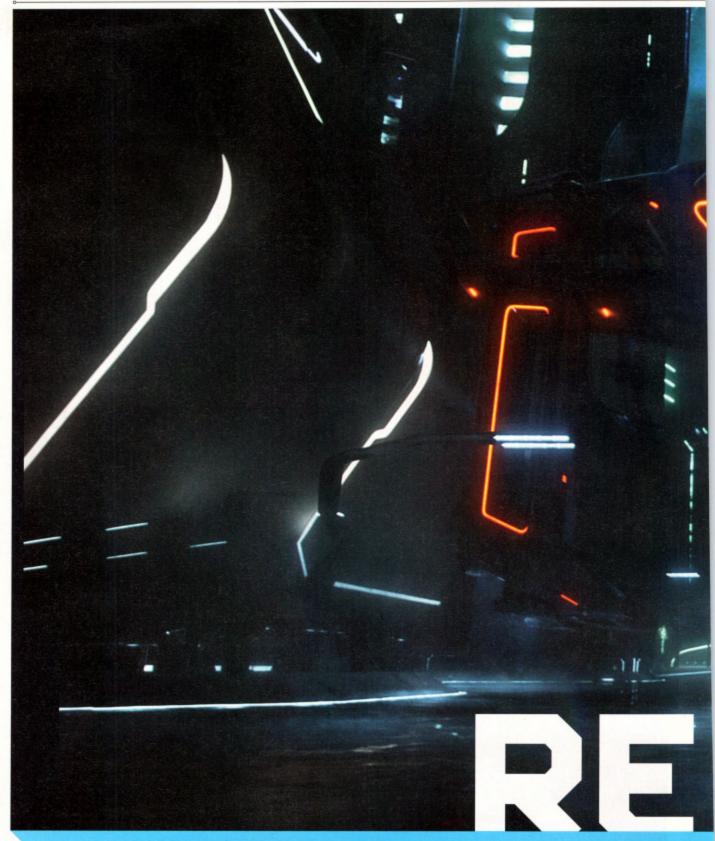




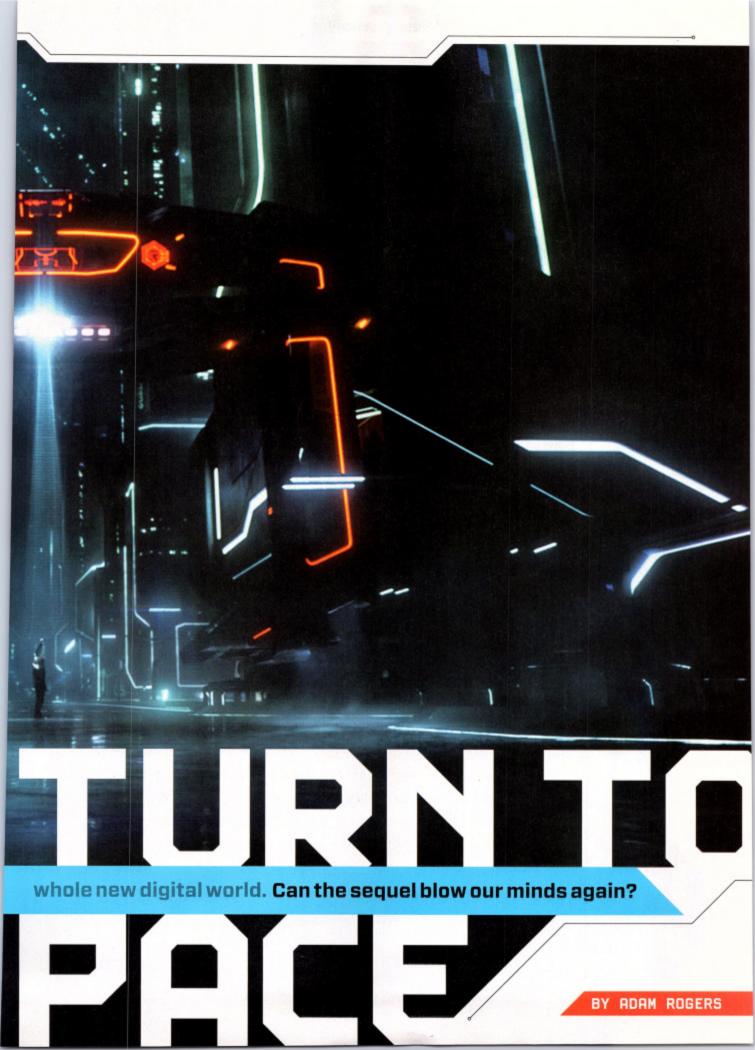


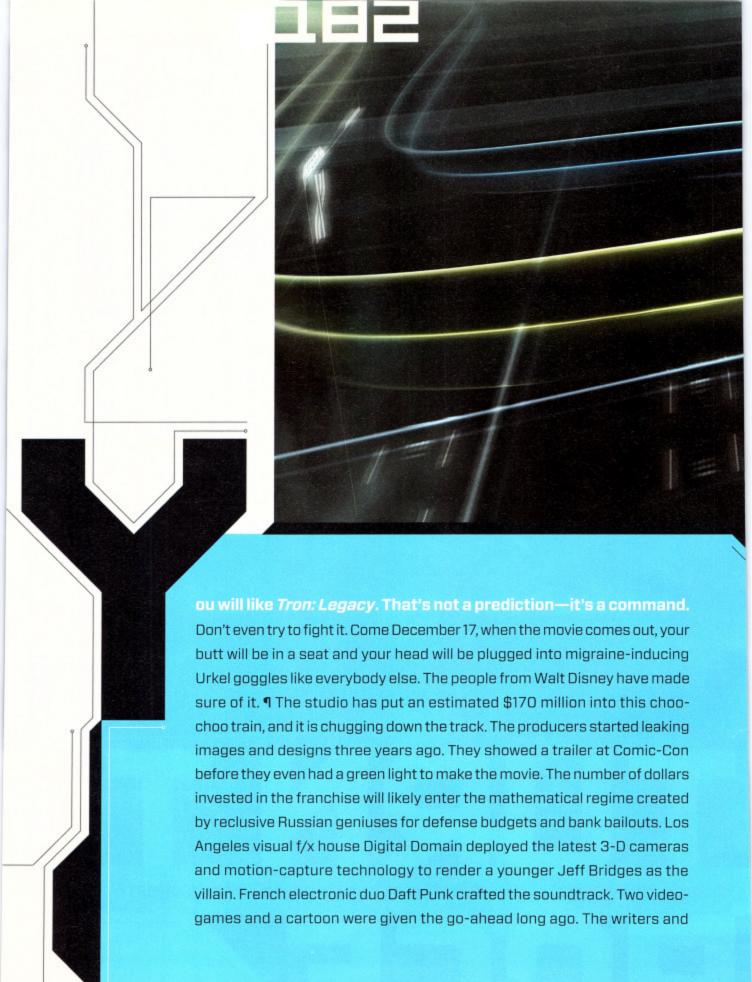
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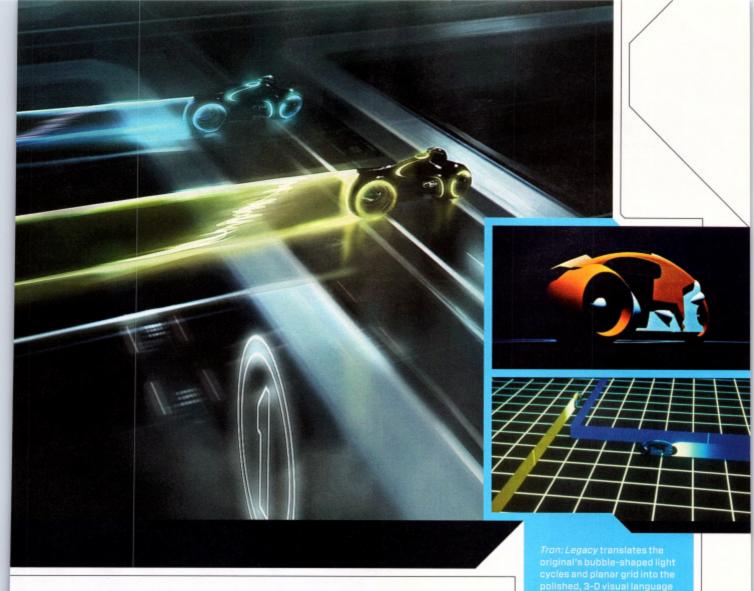
TRON: LEGACY 180 | SHOPPING HACKS 188 | INSANE CLOWN POSSE 194 | BLOOD SIMPLE 200 | PARALLEL UNIVERSE 208



The original TRON introduced us to a







director collaborated on the script to ensure the production design meshed with the story, and vice versa—they even ran an early cut past the story gods at Pixar, all just to make sure the movie would actually, you know, "work." They spent years figuring out how to make Tron: Legacy connect to its antecedent. Tron: Legacy is a sequel—everybody already knows that—and the people making it knew from the start that to be a success their movie had to evoke the look and feel of the original Tron.

Yes, Tron. The motive force behind this winter's biggest cinematic event is a weird little sci-fi flop from 1982 that no one really remembers. Seriously: Try. You'll get bits. Images, mostly. Jeff Bridges in chalk-white armor that ripples blue. Glowing Frisbee fights. Bubble-shaped motorcycles trailing walls of light. But the story? Something about a hacker, maybe? He gets beamed into a computer and fights a giant. Bruce Boxleitner is there. And ... the villain is a

computer program with a British accent.

Don't feel bad. Even *Legacy* director Joseph Kosinski admits to having initially been fuzzy on his source material. He didn't see *Tron* until he was a teenager in the mid-1980s, on VHS. He was more of a *Raiders of the Lost Ark* kind of guy.

So why all this fuss? With almost a century of back catalog to draw from, why should Disney go all in on a sequel to a movie that's generally regarded as not very good? Because Tron succeeded at what science fiction rarely attempts and almost never pulls off: It predicted the future. That little movie distilled and made visible a powerful idea-that inside a computer is a world, a place you (or some part of you) can go and live. This idea didn't make much sense at the time, of course. It was utterly new and poorly expressed, and the technology to pull it off didn't really exist. A movie about the magic and power of computing also happened to be the first movie made by computers ... which, sadly, were then neither magical nor powerful. No wonder it fizzled at the box office. The metaphor, however, lived on.

The film would never come close to an Oscar, but that doesn't make it unimportant. Nobody talks about cyberspace anymore—sci-fi writer William Gibson had just coined the term when Tron came out. But that's what the movie gave shape to—a "consensual hallucination," as Gibson wrote, "bright lattices of logic unfolding across that colorless void." Though Gibson says he had an entirely different look in mind. "An issue of Omni magazine that contained one of my earliest cyberspace stories also contained a preview of Tron," he says. "If Disney was into that stuff, I thought, I wasn't even remotely ahead of the curve."

Gibson's stories were way out in front, of course, but Tron was the first mainstream pop-culture artifact to have similar insights about what cyberspace was and what it was going to become. The world it envisioned and the metaphor it helped create have become more resonant over the decades, as the movie essentially came true. Everything that looked weird in 1982 now looks naive, perhaps, but also profound. Insightful even.

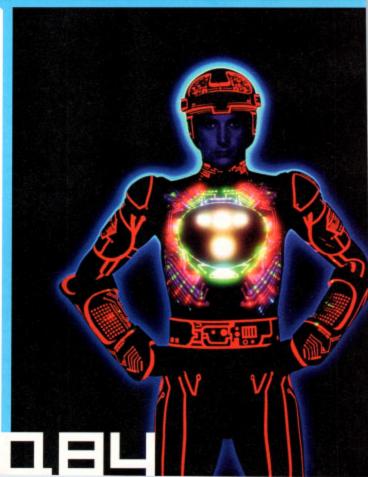
For Tron: Legacy to succeed where Tron failed, it has to simultaneously sustain the integrity of and improve upon the first film. Lucky for Disney, the tools finally exist to make the movie that the original team was groping for but never quite found.



Tron started in the late-1970s as a TV commercial, a neon-lit little figure in a shiny black universe. Running the animation house that created him was Steven Lisberger, a twentysomething director who was convinced that the character could be in a movie created exclusively by computers. Today Lisberger is a shaggy, goateed guy who talks articulately about how baby boomers misapprehended the messages of Carl Jung and Joseph Campbell. He's a compelling mix of Obi-Wan Kenobi and the Dude. "There was a feeling amongst a certain group of Hollywood filmmakers that with all of these tools, CG was ready to be taken advantage of," Lisberger says. "And it was like, who was going to get there first?"

In 1978, Lisberger met Bonnie MacBird, a midlevel development executive at Universal Studios, and the two hit it off. MacBird left Universal and joined Lisberger's company. He was working on early computer animation tools, and *Tron* looked gorgeous. But beyond a sense that the plot should have something to do with videogames, he didn't have a story. "We had no idea how Hollywood worked," Lisberger says. "But when I met Bonnie, I thought, this is a person who knows what's involved in doing a script."

MacBird turned out to be perfectly engineered for





the job. She had studied programming, with paper and pencil, in junior high school in the 1960s. In college at Stanford, she made punch cards for a PDP-11, working late at night because it was the only time students could get access to the machine and playing a rudimentary version of *Pong* with lights on the computer's control board. At Universal, she tried (unsuccessfully) to persuade the story department to put its records into a database. "I'm not a computer programmer," MacBird says. "But I love the way a real computer scientist dreams."

In Los Angeles' only computer store, a dive on a Santa Monica side street, MacBird found the writing of Stewart Brand—creator and editor of the Whole Earth Catalog, cofounder of the seminal Internet network the Well, and coiner of the phrase information wants to be free. From Brand she learned about the

IPad Extra: To see and hear more from Tron, download WIRED from the iTunes Store.

work of computer scientist Alan Kay.

It's a name that should make you feel a great disturbance in the Force. Kay was present at Douglas Engelbart's famous "mother of all demos" in 1968, in which Engelbart introduced the mouse, a windows-based operating system, hypertext linking, word processing ... it's as if pork chops, bacon, and ribs all came from the same magical animal. (A year later, Engelbart's lab would become the second node on the nascent Internet.)

Kay's work was even more out-there. He was reading Marshall McLuhan's rants on media and immersing himself in the learning theories of Jean Piaget and Seymour Papert. He'd also been "hit on the head," as he put it, by a 1968 demo at the University of Illinois of the first flatscreen display. Seeing that led Kay to anticipate a time when computer chips would be small enough to pair with it—to make a laptop, essentially. He coined the term personal computer, and working at the Xerox Palo Alto Research Center, Kay

Jeff Bridges, a visual f/x team captured the actor's facial movements, transferred the CG version onto another actor, and then fine-tuned hair, eyes, and illumination, (Left) Olivia Wilde as Quorra; Bruce Boxleltner from the first Tron.

and his team combined Engelbart's innovations with their own work to create the first graphical user interface. This is the thing that inspired a young Steve Jobs to create the Macintosh computer ... which inspired a young Bill Gates to create Windows.

So in 1979, MacBird set up a meeting with Kay. "He spent several hours with us," she says, "and regaled us with stories about computers and learning and science and child psychology." For her, Xerox PARC's bean bag chairs and bohemian attitude had a kind of glamour. "It was early nerd culture, and it was adorable. I just loved it," MacBird says. She persuaded Lisberger to hire Kay as a consultant.

"We didn't have the word avatar yet. We



Steven Lisberger, and director Joseph Kosinski (far right, from top) built a world that evoked the original film but with sleek upgrades: elaborate sets, choreographed fights, and stifling costumes.

talked about agents," MacBird says. "Alan had the notion of an intelligent agent that learns you, learns your preferences and needs and can function in a realm of endless encyclopedic information." She loaded all of these ideas into what she describes as a funnier but deeper version of the movie. "Nothing wrong with light cycles and so forth," she says. "But I think there was more to it than that originally." Kay believed that a universe made of connected computers was akin to a living organism, a vast network with nodes and branches to infinity, all serving some artistic, humanitarian vision of a utopian future.

Those concepts became the source code for *Tron*. The lab at tech giant Encom, the company at the center of the movie, was



based on Kay's lab at Xerox PARC and the Stanford Artificial Intelligence Lab. Bruce Boxleitner's buttoned-down programmer character, Alan, was based in part on (and named after) Kay. MacBird even sent versions of the script up to Xerox PARC via acoustic coupler and edited them with Kay on the Alto, Xerox's way-ahead-of-

its-time PC. "I think that makes me the first screenwriter ever to use a computer to edit a script," she says. Kay showed her how to select a font, and she chose the closest approximation to Courier so the studio suits would think it was typewritten. (To this day, screenwriters still use Courier.)

Lisberger had planned to fund Tron inde-



pendently, but when that didn't pan out, he took it to Disney. The studio was trying to get a grip on the relatively new phenomena of the summer blockbuster and the science fiction epic. Fox had cranked out Star Wars. Columbia Pictures had Close Encounters. And Disney made ... The Black Hole. But to a certain faction at Disney, Lisberger and his studio felt like a good fit. "We had a staff of animators, and we approached the project as an animated film," Lisberger says. "When we came into Disney, we had storyboards, we had production art." He even shot a few minutes with computer-generated effects and animation to give the bigwigs an idea of what they would be getting.

As Tron evolved, it became more of an oddball project. "We were a threat to the animation department. We were a threat to the special effects department. We were a threat to conventional live action," Lisberger says. Star Wars made a kind of sense, with its knights and princesses. But combine

the avant-garde production design of *Tron* (and multiple outside contractors doing CG) with what turned into a very religious script about living "programs" trying to commune with godlike "users" in the real world? In the actual real world, hardly anyone had ever touched a computer. You can see how that story would seem strange.

The late 1970s and early 1980s were an exciting time for technology—the cusp of the future. The Apple II plus went on sale in 1979. At Industrial Light & Magic in California's Marin County, the men who'd go on to found Pixar were working on CG effects for Star Trek II and inventing George Lucas' videogames division. William Gibson was inventing cyberpunk. But in Hollywood, it was basically still 1970. In the end, Disney and Lisberger touted the movie's computergenerated imagery, but in truth, very little of the film was actually CG. Some of the images were striking-the light cycle chase, the climactic battle against the evil Master Control Program-but with the funky light-up costumes and shifting, vertigo-inducing backdrops, they were occasionally outright weird. Tron got better reviews than people remember-hey, Roger Ebert liked it-but the film never really clicked. And it had the misfortune of premiering the same summer as Steven Spielberg's ET: The Extra-Terrestrial, Ridley Scott's Blade Runner, and Star Trek II: The Wrath of Khan. It was a year of nerd classics, all of them arguably better made, more ambitious, more coherent. "The night before the movie opened, the head of marketing came to me and said, 'We're going to do really well. Our expectation is to do \$10 million this weekend, maybe more," Lisberger says. "We did half of that."

Not everybody lost. Arcade and home console games based on *Tron* were successful. Lisberger went on to make a comedy called *Hot Pursuit*, John Cusack's fourth-best film. MacBird ended up with a somewhat modest story credit, but in the end she got a lot more out of the deal. Her collaboration with Kay turned out to be what Hollywood screenwriters call meet cute—MacBird and Kay fell in love and got married in 1983.

Tron, however, seemed destined to be forgotten—except by those few thousand preadolescent kids who watched it, rapt, while their parents wondered just what the hell kind of Disney movie this was, anyway. And some subset of those kids went on to become directors, | CONTINUED ON PAGE 218

# YBER VISIONS

Tran may have provided mainstream pop culture with its first depiction of the digital realm, but a handful of other books, movies, and games have augmented our vision of how humans might inhabit bytes. —A.R.

#### 1975

The Shockwave Rider | The electronic network in John Brunner's proto-cyberpunk novel was the backdrop for this early portrayal of a savantlike hacker fomenting revolution.

#### 1981

"True Names" | Writer Vernor Vinge's "other plane" was the first depiction of the digital world as an actual place where computerized versions of people could go.

#### 1984

Neuromancer | William Gibson's fiction gave the online world a name that stuck: cyberspace. The description sounds a lot like Tron's universe, with a dose of druggy surreality.

#### 1986

Habitat | Made by Lucasfilm Games, it isn't exactly an RPG but is generally considered to be the first online graphical virtual world.

#### 1992

Snow Crash | Writer Neal Stephenson's "metaverse," a 100-meter-wide, planet-spanning road, owed as much to computer games as to hacker culture. First use of the term avatar.

The Lawnmower Man | A more Gibsonian version of cyberspace. Same glowing jumpsuits as in Tran, though.

## 1995

Hackers | A glowing-grid version of cyberspace that, as in Tron, evoked the cityscape-like silicon canyons of a printed circuit board.

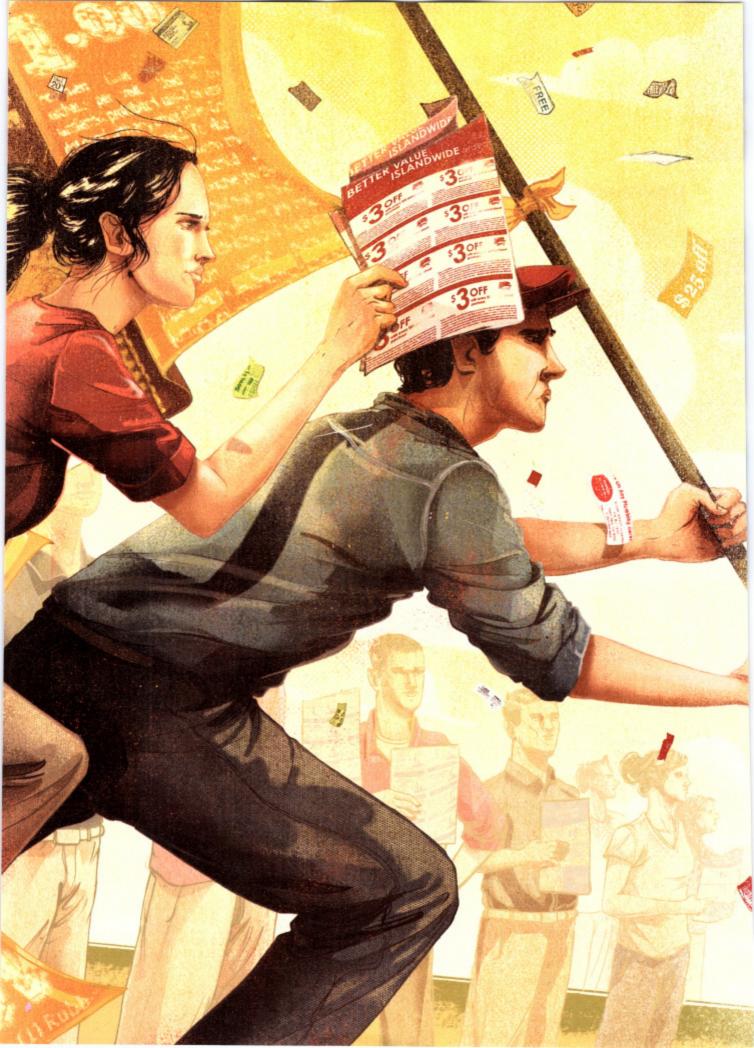
Johnny Mnemonic | The lackluster film adaptation of Gibson's short story depicted a surreal and formless bytescape accessed via virtual-reality goggles. As Keanu might put it: "Whoa."

#### 1999

The Matrix | A digital universe that looks just like the real world. In fact, it's indistinguishable— except for the "cheat codes" that provide superpowers.

#### 2003

Second Life | A free-form, selfcontained universe, Like the Sims but with a lot more avatars shaped like penises.



From Groupon to Gotta Deal, how shoppers retailers at their are beating OWN Game. LUSTRATIONS EY JONATHAN BARTLETT BY MATT SCHWARTZ

BEE

# IN THE ECONOMIC WASTELAND

of the past three years, the biggest success story has been a website that gets us to buy stuff we never knew we wanted: helicopter-flying lessons, hot stone massages, professional photo portraiture, obscure ethnic food, hot air balloon rides. More precisely, what we buy at Groupon—the two-year-old startup that, with projected revenue of more than \$500 million

this year, was called the "fastest growing company ever" in a recent Forbes cover story—is the right to buy all that stuff at a huge discount, so long as we all act fast. In other words, what Groupon sells (as its clever name indicates) is coupons, but with a social twist. It's been such a huge moneymaker that scores of copycats have emerged, including other startups like LivingSocial and 8coupons. Established online presences like Yelp and OpenTable have also jumped in; the biggest and most recent entrant is AOL, which in October announced its own Groupon clone, Wow.com.

Like its competitors, Groupon makes money by turning its audience into bar-

gain junkies. Every day, customers check their email or the Groupon website to find out about the daily deal in their city. (Groupon already operates in more than 100 cities nationwide.) For the coupon to become valid, a certain number of users must agree to buy it. But then, after the offer "tips," they have just 24 hours-or less, if it sells out-to pay their money and lock in the markdown. As Andrew Mason, Groupon's 30-year-old founder and CEO, sees it, this tantalizing window of opportunity gives people the license to indulge in experiences they wouldn't otherwise pursue. "That's the beauty of the model," he says. "We're using these game mechanisms to trick people into getting out of the house and doing the things they always wanted to do."

Take a step back, though, and what Groupon represents is something far bigger. It's the mainstreaming of a new current in American consumerism, an attitude born of the Internet's DIY ethos and nurtured by the hard economic times. One might call it retail hacking: the reconception of shopping as not just a full-time job but a contact sport, a scrum in which consumers increasingly refuse to buy on the terms dictated to them. A whole net-

work of so-called deal-hunting sites, each with a large and devoted community, has sprung up for users to trade inside tips about little-known bargains; the largest of these sites, SlickDeals, has more than 700,000 registered members.

In this passionate consumer underground, techniques for chiseling a few percentage points (or more) off a sticker price can quickly spread to millions of shoppers. The process of selling a DVD player or even a new razor to the growing ranks of self-educated buyers is becoming as tortuous as selling them a new car. GetHuman.com, a continuously updated list of direct customer service lines and telephone-prompt guides, is under-



mining the ability of companies to resolve calls with automated systems. Consumers who have learned to haggle on prices at large chain stores-Target, Home Depot, Best Buy, and more-share their stories and methods on sites like the Consumerist, a blog that has become a hub for retail hackers. When Ely Rosenstock, a 29-year-old social media consultant from New York, wanted to cancel his Verizon service and buy the new iPhone, he found a loophole that let him leave his two-year contract with no termination fee; after he made this

argument stick with Verizon customer service, he posted a detailed how-to video on YouTube that has been viewed more than 180,000 times.

As recently as five years ago, it would have taken years of dedicated trial and error for consumers to develop these techniques on their own. Now, thanks to forums that aggregate the collective urge to save money, novice deal hunters have access to FAQs and tutorials addressing everything from the inventory cycle at Target to methods of handling hostile cashiers. For those who know where to look, these sites form a sort of Wiki-Leaks of secret deals, a searchable directory of rock-bottom prices and money-saving techniques as labyrinthine and cunning as the retail universe it seeks to map.

In this world, each product has two prices. First there's the suggested retail price—"a blatant lie," as Jeffrey Tan, a top-ranking SlickDeals user, calls it—paid by everyone else. Then there's the real price, available only to the deal-hunting elite.

# MOST RETAIL HACKERS

try to get their edge by manipulating one of the oldest promotional tools around the coupon. The origin of the coupon

is usually traced to the late 19th century, when a former drugstore owner named Asa Can-

dler distributed small certificates entitling the bearer to a free glass of his new tonic, called Coca-Cola.\* Ration books distributed during World War II established an indelible If you know where to look, there's a sort of WikiLeaks of secret deals, as labyrinthine and cunning as the retail universe it seeks to map.

link in the American mind between the act of clipping and the virtue of thrift. By the 1960s, coupons were a fixture on the retail scene; one industry leader, S&H Green Stamps, claimed to print three times as many stamps as the US Postal Service. Shoppers could accumulate the stamps from participating stores and then redeem them for such rewards as toasters, clocks, and insurance policies.

At the turn of the millennium, coupon use began to slide, from 4.6 billion coupons redeemed in 1999 to 2.6 billion in 2008. Then the recession hit, triggering a coupon resurgence, driven in large part by the Internet, before anybody had even heard of Groupon. Millions of unemployed consumers rediscovered the coupon as a way to generate money-or at least cut household costs-during their idle hours. And retailers responded to flagging sales by invigorating their offers. The value of the average coupon has risen from \$1.09 to \$1.37 since 2005. Redemptions grew by 27 percent in 2009 alone, with Internet coupons leading the way, rising more than threefold. Online coupons have proven stickier than their paper counterparts, accounting for around 1 percent of all coupons issued but nearly 10 percent of those redeemed, According to Nielsen, the "enthusiast" couponers who use online offers most are likely to be relatively young and high-income, with 60 percent making more than \$50,000 a year.

The retail industry is still adjusting to the new generation of coupon shoppers, many of whom aren't content to limit themselves to one or two deals per trip. Some of these so-called super-couponers have perfected a maneuver called stacking-combining multiple coupons on the same item, generally a manufacturer's coupon with a retailer's. Another technique is rolling-using earnings from retail loyalty programs (for example, CVS Extra Bucks) to buy products that earn still more points, generating a continuous flow of extra earnings. The online boards teach all these tricks and more. "Don't be scared! You can do

this!" begins one SlickDeals FAQ, before it launches into a series of links to newspaper coupon-insert schedules, store-by-store coupon acceptance policies, and thousand-line wikis with deals alphabetized by product and coded by state. There are coupon swap threads as well as RAOK (random act of kindness) threads in which coupons are given away to the first user who requests them. Members of "coupon trains" circulate their surplus coupons through the mail, taking what they need and adding what they have. "Coupon fairies" act as anonymous benefactors, bringing extra coupons to the store and leaving them on the applicable products.

"These wack-jobs who spend 20 hours a week stacking coupons? That stuff drives us batty," says John Morgan, executive director of the Association of Coupon Professionals. "They dance all over the rules. These zealots may be following the letter of the law, but I don't think they're respecting its spirit."

Indeed, manufacturers and retailers do not issue coupons with super-couponers in mind. Sometimes coupons are designed as "loss leaders" for stores, which hope to lure new or irregular customers inside. Other times they're inducements for consumers to try—and hopefully get hooked on—a new product. But most often they're used for what economists call price discrimination. Consider a product that costs a retailer \$10 and sells for \$15. Somewhere out there, the

<sup>\*</sup> To see this ur-coupon and read its backstory, check out "First Coupon Ever" in issue 18.11, online at http://wrd.tw/firstcoupon.

# A DAY OF DEAL HUNTING

theory goes, are price-sensitive shoppers who would pay \$12 if given the chance—still a profitable sale. By targeting this group with a \$3 coupon, the store generates additional sales at a margin of \$2 per unit, without giving up any of the \$5-per-unit profits from the price-insensitive group.

Super-couponers complicate this theory considerably. According to Donald Lichtenstein, a professor of marketing at the University of Colorado at Boulder, super-couponers have learned to ignore "acquisition utility," the pleasure and value one obtains from. say, a box of cereal. Instead, they peg their shopping decisions to "transaction utility," the difference between what they're getting the cereal for and what they think the cereal is supposed to cost. In other words, supercouponers don't perceive a grocery item as food, at least not until they exit the store and serve it for breakfast. On the shelf and in the cart, the super-couponer evaluates products with the cold-eyed calculus of a trader.

# FOUR YEARS AGO,

Michelle Harrison, a 38-year-old CPA and mother of two, was just a casual deal hunter. During special sale weeks at Lowe's Food

Stores, she would spend an hour clipping The Charlotte Observer and be able to come back with perhaps \$125 worth of groceries for \$25. Then, at church, she met some other mothers who told her they could turn \$25 into \$250.

"My competitive type-A behavior kicked in," she says. "I asked myself, what am I not doing that I should be doing? What's out there that I don't know about?"

So began what Harrison calls her "hardcore" phase. She started buying four or five
copies of the Observer each week; whatever
she didn't use, she would swap online at
Hot Coupon World, where she soon rose to
the level of moderator. She learned how to
time prices and decipher barcodes, and she
happily shared her knowledge with anyone
who wanted to learn. As the economy turned
sour, Harrison began to distribute groceries from her own "stockpile" (which grocery
deal hunters inevitably acquire) to local
families in need. On a site called Charlotte-

Mommies.com she developed a following of area mothers, and together they established an informal code among themselves—share what you know, share what you have, and obey all store and coupon policies.

One morning in September, Harrison and four of her disciples gather at a coffee shop to trade couponing stories. Harrison is dressed sensibly in sandals, black pants, and a black blouse with silver appliqué. On the table in front of her, next to her croissant and Diet Coke, is a slender business envelope containing more than 30 coupons.

One acolyte, Lolly Miltz, explains her own attitude toward the project: "I try to keep it fun. I walk in, introduce myself to the manager, and say, 'You better call the police. I'm getting ready to rob ya!" Miltz, who has a breezy manner and two bright yellow swoops of hair, holds in her hands a massive purple binder containing maybe a thousand coupons-some clipped from Sunday newspapers, some printed from the Internet, some purchased on eBay. "I wonder why they waste money on advertising," she muses. "We'll buy whatever they want us to buyas long as they pay us to buy it."

This is the fourth day of Super Double Coupon Week at Harris Teeter, a southeastern supermarket chain. Each day this week, Harris Teeter will double the face value of most coupons to a maximum of \$1.98 apiece. So Harrison has been visiting her local store once a day, every

day, armed with a carefully selected battery of coupons. Her goal today is to bring home \$80 worth of merchandise while spending less than a dollar out of pocket.

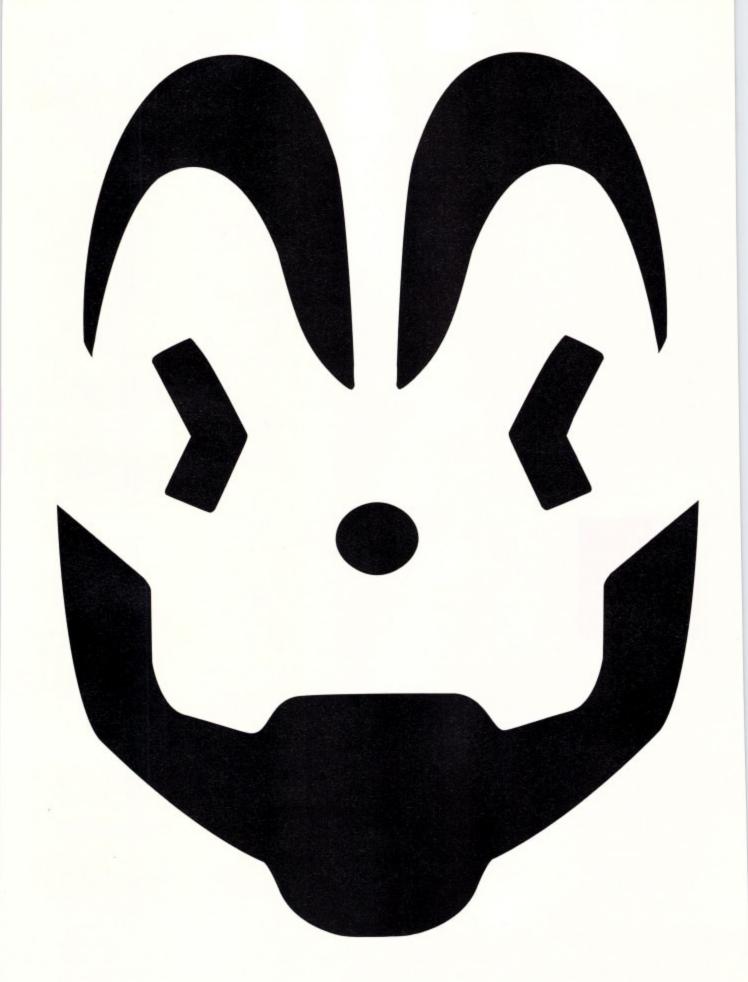
Harrison enters Harris Teeter shortly after 11 am. She selects a cart, makes a quick right toward the produce section, and picks out

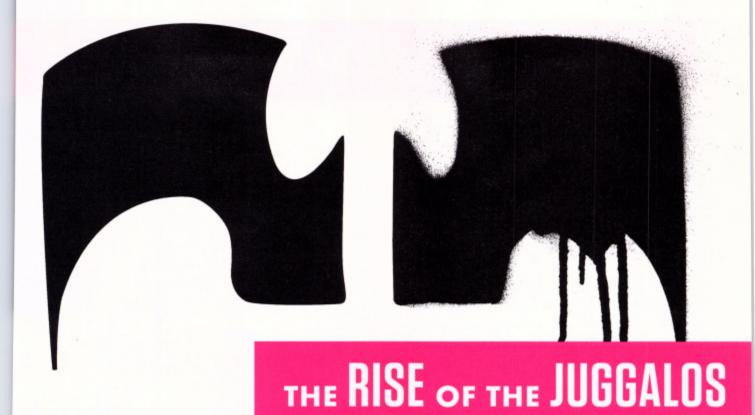
Warning: Retail hacking can be a full-time job. Here's what your daily routine might look like if you got serious about tracking down bargains. (All times Pacific.) — M.S.

- 5:10 AM Check email for Groupon's Deal of the Day and Living-Social's 1-Day Deal.
- 8 AM Log in to Hot Coupon World and search for grocery deals in the Coupon Database.
- 8:30 AM Expand your coupon trove at the Printable Coupons section of RetailMeNot
- 9 AM Add to your arsenal of paperless coupons by loading a batch onto your phone at Cellfire.com.
- 10 AM Swing over to Newegg.com for the daily Shell Shocker deal: typically discounts of 30 percent or more on tech gear.
- NOON On Tuesdays, this is the optimum time to find the cheapest domestic fares at Kayak, Hotwire, and other bargain travel websites.
- 2 PM Visit the Freebies section at Buxr for a compendium of links to free trial products like detergent, over-the-counter medicine, and magazine subscriptions.
- 3 PM Check out 6pm .com, a sister site of Zappos.com that sells

- brand-name apparel at outlet-store prices.
- 5 PM Browse the Best Deals section of Fat-Wallet.com.
- 5:30 PM Scope out the Clearance section of SmartBargains.com, which offers apparel and furnishings for as much as 90 percent off.
- 6 PM Peruse the Gold Box section of Amazon .com for the Deal of the Day and the ever-changing Lightning Deal.
- 8 PM Hit the front page of Spoofee.com to browse a broad mix of user-rated daily deals from around the web.
- 9 PM Look over the various offers and coupons at Dealspl.us, where user votes determine which deals appear on the front page.
- 10 PM A new Today's Woot—a deeply discounted deal-of-theday—goes live at Woot.
- 11 PM Scan the Editors' Choice tab at Dealnews, a curated bargain-hunting site.
- MIDNIGHT Check the Hot Deals subforum at SlickDeals for new deals on Xbox, Play-Station, and other gaming systems.

an organic red bell pepper for \$1.99. Taking the first coupon from her envelope—\$1 off organic produce, \$1.98 after doubling—she places it in the front-left corner of her cart. "I'm on a mission here," she says, her shoes tapping out a staccato rhythm as she moves over the tiled | CONTINUED ON PAGE 222





How a pair of outcast rappers in face paint built an Insane Clown Empire.

BY BRIAN RAFTERY



# VIOLENT J WANTS TO PLAY ME A SONG.

It's a late-summer evening in suburban Detroit, and J—whose real name is Joseph Bruce—is unwinding in his home studio, a compact yet neatly kept space decorated with wrestling belts and posters of Eazy-E and Michael Jackson. As one-half of the white-rap duo Insane Clown Posse, Bruce, a rolypoly 38-year-old, has recorded or produced hundreds of songs here. But this one, he says, is a favorite. ¶ "Do you know who Color Me Badd is?" he asks in his sleepy-bulldog voice, a lit blunt jutting from his mouth. "They were the shit. We did a song with their lead singer." He cues up 2007's "Truth

Dare," a thumping, midtempo number that sounds a bit like a nursery rhyme singalong, complete with playground taunts:

I double-dare you: Swallow every pill in the bottle. I double-dare you: Tongue-kiss a toilet seat at McDonald's. I double-dare you: Dig up a body and take it home. Give it a sponge bath, and do what you want with it.

As the track plays, Bruce's musical partner and childhood friend, Joey Utsler (a ka Shaggy 2 Dope), sits quietly to the side, nodding and rubbing the gothic D tattooed on the back of his shaved head. Utsler is 36 and lean, with talon-sharp fingernails and the sand-papery voice of a lifelong smoker. He tends to be more voluble than Bruce, who's pausing the song every few seconds, explaining how he paid Bryan Abrams—the R&B smoothie behind such '90s hits as "I Wanna Sex You Up"—a mere \$10,000 to guest on the track. The two men have even been talking about signing Abrams to ICP's Psychopathic Records, a label better known for makeupwearing, murder-obsessed rappers than for preening lovermen.

The song ends, and Bruce beams in his chair. For an ode to hygienic necrophilia, "Truth Dare" is surprisingly hummable. It might even be one of Insane Clown Posse's best songs. Of course, that's not saying much, seeing how ICP's discography comprises some of the most profoundly vile music ever made. In the two decades since Bruce and Utsler formed the group, they've churned out more than a dozen albums' worth of gleefully misogynist, cartoonishly violent songs. In ICP's world, rednecks are carved up and eaten ("Chicken Huntin'"), pedophiles are stabbed in the colon ("To Catch a Predator"), and STDs get their own anthems ("Bugz on My Nugz," which is performed, in part, in the imagined style of high-pitched venereal crabs). "Our shit is definitely male-oriented," Bruce says.

The ICP aesthetic is a below-brow mix of Tales from the Crypt comics gore and puerile shock-jockery. It's most proudly displayed during the group's live act, in which Bruce and Utsler—both of whom hail from the suburbs—disguise themselves with black and white clown makeup and throw gangsta leans while dousing their audiences with sticky geysers of Faygo, a midwestern econo-buy soda. Not surprisingly, the music industry has long treated ICP with the sort of wary contempt with which one would eye a Chinese battery

landfill. Radio stations and MTV mostly refuse to play the band, while critics have declared ICP the worst act in music (*Blender*) and dismissed the group as a modern-day minstrel act (*Spin*). And though ICP has been signed to major labels several times, each deal has collapsed.

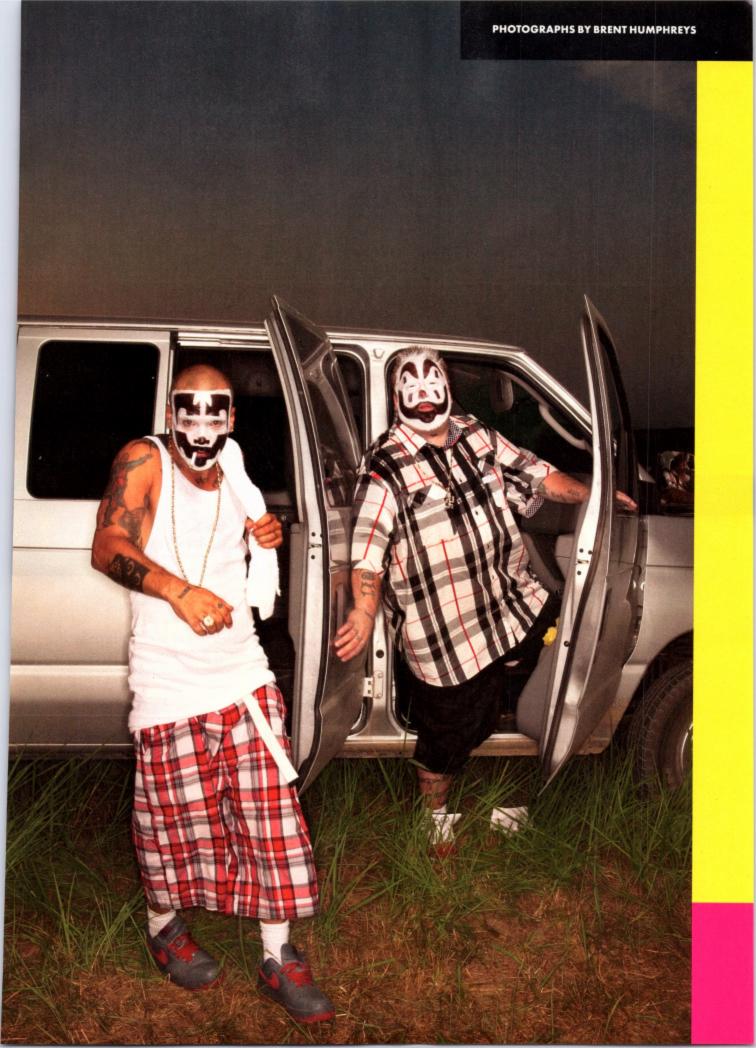
For years, ICP operated on the fringes of the record business, selling just enough discs to get the media's attention, however unfavorable. But by the early '00s, with Eminem and Saw-style torture-porn movies making millions, ICP's face-painted crudity no longer seemed outré. For a good decade or so, most of the mainstream world basically stopped paying attention to Insane Clown Posse, and the group went underground.

That is, until last spring, when the men behind ICP did something so strange, so offensive, the rest of the world couldn't help but take notice: They got deep.

In April, the group released a music video for a piano-plinking, synth-heavy song called "Miracles." In the clip, Bruce and Utsler, dressed all in white, cavort in front of a series of epic, if poorly done greenscreen backdrops—the pyramids, outer space, a giant telescope. Lyrically, there's not a single chopped-up hillbilly or chatty STD to be found; instead, the group praises the mysteries of earth, from the sun to Niagara Falls to giraffes. The song's best-known lines appear just shy of the two-minute mark: Water, fire, air, and dirt/Fuckin' magnets—how do they work? The clip was an immediate web sensation, mocked on Videogum and Gawker, lampooned in The New York Times, and eventually spoofed on Saturday Night Live. Though Bruce and Utsler had conceived "Miracles" as an

earnest and fairly straightforward ode to the natural world, blog commentators and YouTube pundits were unsure of the song's meaning: Did these guys really not know how magnetism works?

The more Utsler (left) and Bruce are shunted to the margins, the more their misfit fans love them.





(Answer: They do.) Why do they view rivers and giraffes with such f-bombing fascination? (Because giraffes are cool.) And, most important: Is this all one big joke? (Definitely not.) The aptly named Lake Hepatitis, face paint, and pole dancing at this year's Gathering of the Juggalos.

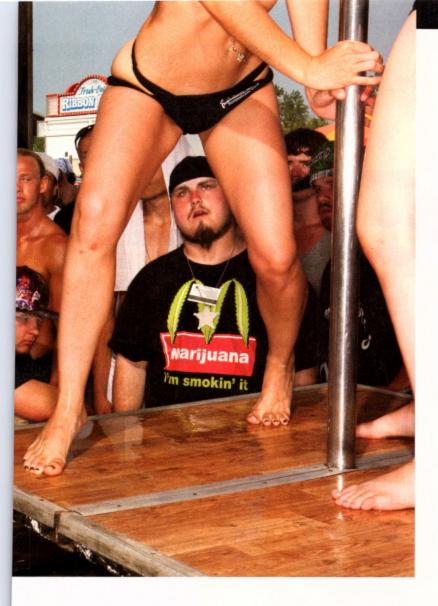
The attention lavished on "Miracles" was largely negative, but it was enough to propel ICP up from the underground-and the duo didn't come alone. Over the past decade, Bruce and Utsler have quietly built a massive pop-culture sleeper cell of fans, who call themselves the Juggalos (so named for a 1992 ICP song, "The Juggla"). While most of us happily ignored ICP, the Juggalos embraced the band's outsider status, helping albums like 2009's Bang! Pow! Boom! debut at number four on the Billboard charts. Over the years, in fact, ICP has sold a respectable 7 million albums. And that's just the beginning. Juggalos also flock to ICP's longrunning online store, which sells everything from action figures to baby gear to an energy drink, Spazmatic. There are ICP movies, radio shows, and an annual music-festival-slash-brand-enhancer, the Gathering of the Juggalos. A recent Nightline segment estimated that Psychopathic has revenue of \$10 million a year, and while Bruce disputes the figure, he owns four homes in Detroit and has already saved up enough to pay the college tabs for his two kids, ages 3 and 5.

The uproar over "Miracles" only increased the devotion of ICP's fans. The group long ago developed a sort of symbiotic relationship with the outside world: The more Bruce and Utsler are shunted to

the margins—whether by critics, labels, or kvetchy bloggers—
the more their outcast fans love them. No wonder the group sells
T-shirts decreeing itself THE MOST HATED BAND IN THE WORLD!
In the weeks after I meet with the pair, they'll travel to promote
Big Money Rustlas, their \$1.5 million comedy-western DVD; coordinate with the folks at Guinness about setting a world record for
battle-royal wrestling (both are huge wrestling fans); and even take
a meeting with VH1 about a possible show. "They wanna see what
we're all about," Bruce says.

While the record industry has haplessly searched for a new business model, Insane Clown Posse has built a veritable empire. Many of ICP's wisest moves were things that once looked like career killers: hanging out with fans while snubbing industry types, starting a niche music festival in the middle of nowhere, and, in Bruce's case, writing a lengthy, soul-baring memoir filled with unpleasant details called *Behind the Paint*. Long before MySpace and Twitter allowed artists to communicate quasi intimately with their fan base and "transparency" had become a marketing strategy, ICP had already erased the barrier between performer and audience.

In doing so, Bruce and Utsler discovered a formula for success in the Internet age that the larger music world is only now waking up to: Build close relationships with fans, develop ancillary profit



streams, keep production and promotion costs down, turn every concert and album into an event (even if that requires industrial soda sprayers), and, most of all, do everything yourself. Bruce and Utsler, in other words, have become two bona fide 21st-century music magnates.

Fuckin' magnates. How did that work?

## PSYCHOPATHIC RECORDS'

headquarters is located in an industrial suburban neighborhood just off Detroit's Nine Mile Road, surrounded by strip malls, warehouses, and a Montessori school. The interior looks like a late -'70s porn set—deep blue wall-to-wall carpeting, chocolate brown decor, a mini-

mum of natural light—and the hallways are covered with posters and cardboard cutouts featuring other ICP acts, each with its own backstory and aesthetic, from serial-killer rap (Twiztid) to gangstazombie rap (Blaze Ya Dead Homie) to southern-gothic rap (Boondox).

On the afternoon I arrive, Bruce gives me a tour of the facili-

ties dressed in a red jersey, denim shorts, and a thick necklace featuring the Hatchetman, the group's cleaver-wielding logo. Without the clown makeup, his facial scruff and sunken eyes are more pronounced.

ICP has had little contact with the corporate music world since it set up this nerve center. With the exception of physical distribution, everything's done in-house by a staff of about 30 full-time employees. There's the 6,200-squarefoot warehouse; an Internet-radio station. W-FUCKOFF; a recording studio; and a setup for video shoots and concert rehearsals (all of the resources are shared by the Psychopathic roster, which consists of more than a dozen artists on two labels). A second warehouse, located just a short drive away, manufactures hats, belts, shirts, stickers, onesies, and all manner of other gear, though half the building will soon be turned over to a new wrestling school Bruce and Utsler are cofounding.

Perhaps the biggest surprise in Psychopathic HQ is the number of gold and platinum albums hanging on the walls. Even in the era of illegal downloads, ICP's fans still buy physical discs, which are stacked around the warehouse. This is partly because the CD packages are jammed with swag, like 3-D glasses and decoding devices. But it's also because ICP has made its albums must-haves for fans by weaving everything from the lyrics to the liner notes into a sprawling, wikiready supernatural epic called the Dark Carnival. It's like the *Lost* universe, only with organ music and evil jugglers.

A convoluted morality tale that purports to document (and punish) mankind's basest desires, the Dark Carnival forms the crux of ICP's comic book mythology. Its origins can be traced to an incident that befell Bruce in the early '90s, a story he relates in *Behind the Paint*. According to Bruce, who says he's experienced several otherworldly visions in his life, a "dark shadow" appeared in the hall outside his room one night. After dropping a series of cards, the figure transported Bruce to a late-

# "EVEN THOUGH WE'VE NEVER MET, WE ALL RELATE. WE'RE FAMILY."

night carnival. Inspired by the encounter, ICP announced it would release six "Joker's Card" albums, each one spotlighting a different carnival character.

For newcomers, divining the specifics of the Dark Carnival plot can be tricky: The music rarely strays | CONTINUED ON PAGE 226

# BLCDDE SIMPLE

Lab reports are often beyond our comprehension. But they don't have to be. Better design and more context can clarify the results—and help us understand our options.

Glucose: 125 mg/dL

The blood test is,

when you think about it, a remarkable thing. With the prick of a needle, the molecules coursing through your veins can be extracted, centrifuged, and translated into a stream of digits, units, and acronyms. Blood becomes data, and in these numbers lies knowledge about

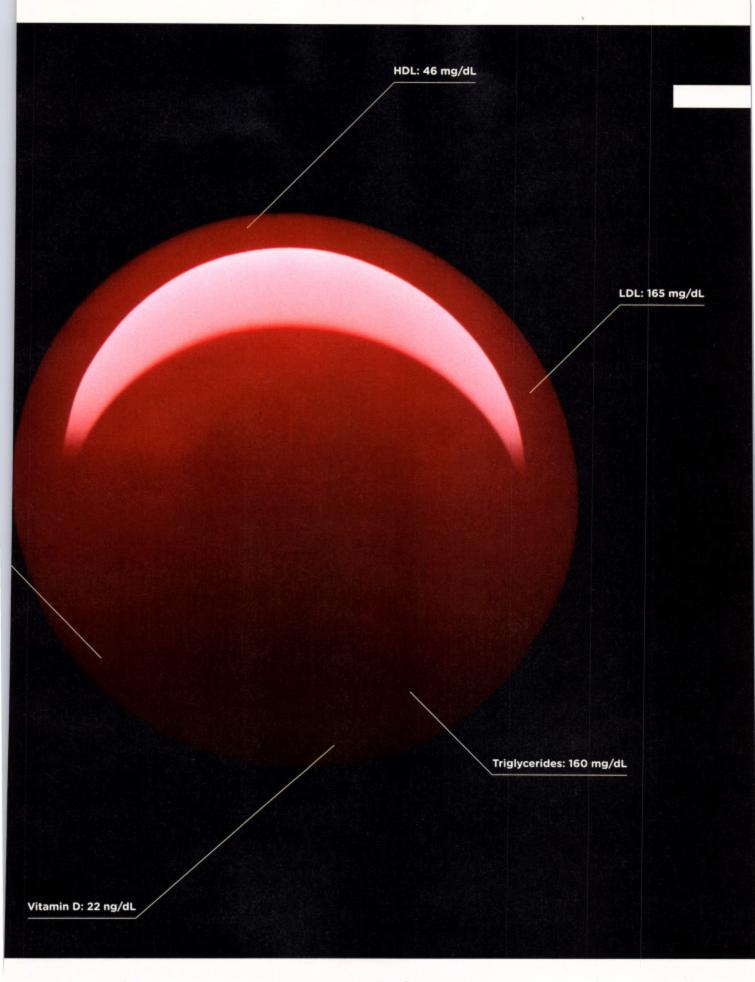
your current health, your risks for disease, and your potential response to treatment.

Of course, you yourself would have a hard time deciphering any of this. The typical blood test report is an exercise in obfuscation, a document that needs to be translated by a lab technician or physician, and that's if you somehow manage to see a copy of your results. In many US states, it's illegal for a laboratory to send test results directly to a patient—a regulatory puzzle that leads some labs to simply deny direct results to any customer, anywhere. The blood may be yours—but the information it contains is not.

But lab reports don't have to be unintelligible. With some thought and design-minded thinking, tests can be as informative to patients as they are to physicians. With a little context and color, we can make sense of the numbers. And with a bit more understanding, patients can become participants in their own health.

On the next few pages, WIRED has given the lab report a makeover. We consulted with Lisa Schwartz and Steven Woloshin, physicians at the Dartmouth Medical School Institute for Health Policy and Clinical Practice and experts in communicating data to patients, to make sure the right information gets onto the forms and the irrelevant stuff stays off. And we tapped three exceptional designers to reimagine how this information can be presented—limiting them to one printed page per report. Consider these a proof of concept, a refutation of the argument that ordinary people can't handle their health (and inspiration, we hope, for the medical establishment).

It's your body. It's your information. Now it's yours to understand.



# The Basic Workup

The standard blood workup takes more than 30 measurements and can go on for more than four pages. All sorts of things can turn up in the report; the challenge for physician and patient alike is to find the signal within the noise.

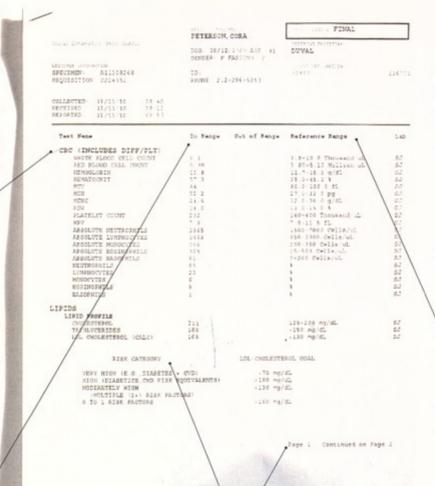
RESULTS REDESIGN BY MUCCA DESIGN

# MAKE IT COLORFUL:

The ubiquity of color printers, email, and PDFs means there's no excuse not to use one of the most effective tools in information design. We adopt a familiar green-yellow-red palette to make it easier to identify what needs immediate attention.

## MAKE IT CLEAR:

Doctors presumably know what high or low numbers might mean. But there's no reason not to augment the data with qualitative interpretations for all results above and below "normal." Are your numbers a little low or a lot low? We explain.



#### MAKE IT EASY:

Listing various "reference ranges" on the right of the page, separate from the results, forces the eye to scan back and forth as you evaluate the numbers. We add charts that depict clearly and succinctly where you fit along the spectrum.

# MAKE IT SIMPLE:

This printout is just the first of four dense pages. The original lists dozens of measurements, potentially too many for even a doctor to comprehend. We summarize the more esoteric tests, focus on the most relevant numbers, and add an overview at the top of the page.

#### MAKE IT RELEVANT:

Information is useless without explanation and a call to action. So we augment this patient's results with the relevant health risks and offer guidance about what the patient might do to improve her health.

# Your Test Results

#### Cora Peterson

Female 41 August 12, 1969 Dr. Pico Duval November 13, 2010, 8:40 a.m. November 13, 2010, 8:12 p.m.

# Your results at a glance:

YOUR GLUCOSE LEVELS ARE TOO HIGH, WHICH INDICATES PREDIABETES.

YOUR VITAMIN D LEVEL IS TOO LOW

YOUR CHOLESTEROL LEVELS ARE BORDERLINE HIGH.

YOUR KIDNEY, LIVER, AND THYROID FUNCTION ARE ALL NORMAL.

## Questions?

Contact the physician who ordered this test for further interpretation of the results:

DR. PICO DUVAL (212) 555-5253

#### RESULTS:

# Comprehensive Metabolic Panel

Glucose (fasting): 125 mg/dL



# Vitamin D

Total vitamin D: 22 ng/mL

DEFICIENCY	INSUFFICIENCY	SUFFICIENCY
< 20	20 to 30	31 to 100
	YOU 22	

# Complete Blood Cell Count (CBC) Normal for all 20 values, including white blood cell count (a high count can indicate infection).

# Urinalysis

Normal for all 20 values, including color, appearance, and protein.

Endocrinology Normal for TSH, which is an indicator of thyroid function, and for microalbumin and creatinine, measures of kidney function.

Chemistry Normal for iron, transferrin saturation, and ferritin. (Abnormal levels could indicate anemia, hepatitis, or other problems.)

# Lipid Profile

Total cholesterol: 211 mg/dL



HDL ("good" cholesterol): 46 mg/dL



LDL (\*bad\* cholesterol): 165 mg/dL

OPTIMAL	OPTIMAL	BORDERLINE	HIGH	VERY HIGH
< 100	100 to 129	130 to 159	160 to 190	> 190
			YOU: 1	

Triglycerides: 160 mg/dL

OPTIMAL	BORDERLINE	HIGH	VERY HIGH
< 150	150 to 199	200 to 500	> 500
	YOU: 160		

# WHAT DO YOUR RESULTS MEAN?

- ELEVATED GLUCOSE: The relatively high amount of sugar in your blood is typical of a patient with prediabetes, which can double your risk for heart disease, depending on other risk factors. See diabetes.org for more information.
- **ELEVATED CHOLESTEROL:** Your relatively high cholesterol (a waxy substance produced in the liver) may also increase your risk of heart disease, depending on other risk factors. See heart.org for more information.
- LOWER LEVELS OF VITAMIN D: Your results suggest insufficient vitamin D, which promotes bone density and immune-system function. Women who fit your profile can become deficient within five months if no action is taken. Vitamin D deficiency may increase your risk for osteoporosis, high blood pressure, and certain cancers.

# WHAT CAN YOU DO?

CONSIDER YOUR LIFESTYLE. If you are inactive, overweight, and/or a smoker, your risk for diabetes and heart disease rises. Exercising regularly (30 minutes/day) and reducing your weight by 5 to 10 percent lowers your risk of diabetes by 58 percent.

ADDRESS OTHER RISK FACTORS FOR DIABETES AND HEART DISEASE. Dietary changes, like reducing alcohol consumption and increasing fruit and vegetable intake, can decrease your cholesterol and triglyceride levels.

ASK YOUR DOCTOR ABOUT REDUCING YOUR HEART DISEASE RISK. Medications like statins can lower cholesterol and delay the onset of heart disease. Calculate your risk at hp2010.nhbbhin.net/atpii/calculator.asp.

CONSIDER LIFESTYLE CHANGES TO CORRECT VITAMIN D INSUFFICIENCY. These include diet, vitamin D supplements, and more exposure to sunlight.

# The Heart Disease Test

Alongside cholesterol tests and high-blood-pressure monitoring, the c-reactive protein, or CRP, test is widely used to spot people at risk for heart disease, the leading cause of death in the US.

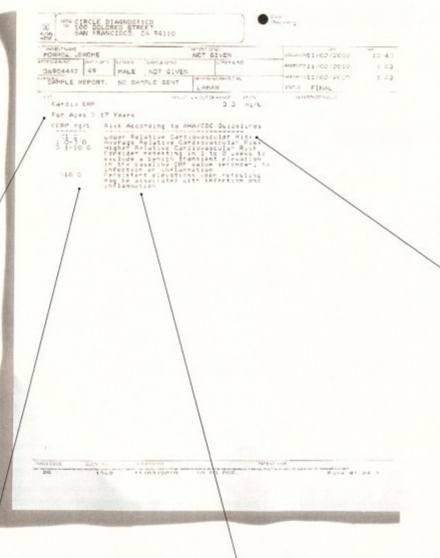
RESULTS REDESIGN BY DAVID MCCANDLESS

## DESCRIBE THE TEST:

The CRP test was invented by Paul Ridker, a Harvard medical professor, to measure c-reactive protein in the blood. High levels indicate inflammation, which can be a sign of infection or cardiovascular disease. Though there's space galore on the page, this report makes no effort to explain the link between CRP and actual heart disease.

# GIVE THE CONTEXT:

A doctor typically orders a CRP test based on the results of a lipid panel (which shows cholesterol levels)-then often orders the lipids again along with the CRP test. The two measures are used jointly to suss out a diagnosis or assess risk. So why not put them together on one sheet of paper? We do.



## PERSONALIZE THE RISK:

The phrase relative cardiovascular risk has little meaning without some context. An online calculator can combine the patient's CRP result and lipid profile to estimate their specific risk. And we give them the URL to let them use it themselves.

#### POINT TO THE NEXT STEPS:

The results are in. Now what? The original report buries advice on retesting in the fine print. We emphasize the point, explaining how a change in behavior (like eating better or quitting smoking) can reduce a patient's risk of heart disease.

# **Blood Work Cardiology Result**

BACTA MEDICAL

ORDERED BY: Dr. Francis Pulaski

Bacta Medical Centre

pulaski.f@bactamed.edu (603) 555-9564 x1523

COLLECTED: 11/02/2010, 10:40 a.m. RECEIVED: 11/02/2010, 1:03 p.m.

# Patient

NAME: Jerome Morrow

GENDER: M AGE 49 DOB: 01/10/1961

About this test

This report evaluates your potential risk of heart disease, heart attack, and stroke.

Your results

CRP level test

Your level of c-reactive protein in the blood. High levels are linked to inflammation of the blood vessels, which has been associated with an increased risk of heart disease.

. High risk of cardiovascular disease

Total cholesterol level

Low risk Average risk

Desirable

Borderline High

Uptimal Near optimal Near optimal high Very high

HDL ("good" cholesterol)

Tourist Low Borderline Optimal No.

Your risk You show an elevated risk of cardiovascular disease.

If you're a smoker with blood pressure of 130 mm/Hg but a family history of heart attack before age 60 (in one or both parents), your risk over the next 10 years is:

15%

Your risk would be lowered to:

12% if your blood pressure were 120 mm/Hg.

10% if you quit smoking.

6% if you reduced your cholesterol to 160 mg/DL.

Use your CRP results and cholesterol level to calculate your 10-year risk of a cardiovascular event at www.reynoldsriskscore.org

What now?



Diet and exercise can improve your cholesterol levels.



Avoid drinking alcohol, except in moderation: one to two drinks per day.



Ask your doctor about statins or other medications that can lower cholesterol.



Consider retesting in one to two weeks, in case your CRP level was caused by infection.

# The Prostate Test

Short for prostate-specific antigen, the PSA test is one of the most common workups for men over 40—even though its reliability as a predictor of prostate cancer is controversial.

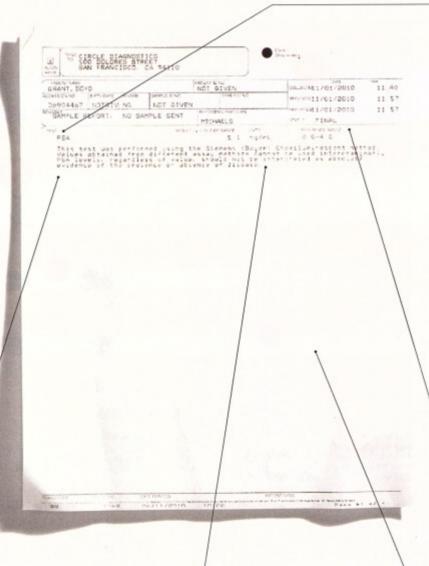
RESULTS REDESIGN BY JUNG + WENIG

#### KEEP IT IN PERSPECTIVE:

Even if he has a high PSA level, our patient's chance of prostate cancer is just 25 percent. And even if he has the disease, there's a 75 percent chance he'll live 15 or more years—and a near certainty he'll be alive in five years.

## UNDERSTAND THE LIMITATIONS:

As the original report states, "PSA levels, regardless of value, should not be interpreted as absolute evidence of the presence or absence of disease." (Even Richard Ablin, the doctor who discovered PSA in 1970, says the test is "hardly more effective than a coin toss.") That's why our revision includes helpful statistics (for example, 65 to 75 percent of men with a high reading do not have prostate cancer). We also list some of the many alternative reasons for an elevated PSA level.



#### **GIVE SPECIFICS:**

Since the prostate produces more PSA as a man ages, some researchers argue that reference numbers should vary by age to avoid unnecessary biopsies. So while the original report shows just one range (0.0 to 4.0), we tailor the risk to our patient's age group (50 to 59). Any lab could do the same.

## KNOW THE CONTROVERSY:

Ablin called the overuse of the PSA test a "profit-driven public health disaster" in a recent New York Times op-ed. He says PSA screenings often lead to unwarranted, dangerous, and expensive biopsies. That won't stop the test from being used—but patients should know that the results are often ambiguous.

# USE THE WHITE SPACE:

The original printout leaves most of the page blank. We put this fallow ground to use, adding more information and context.

# Lab Test Result: PSA

WIRED DIAGNOSTICS

520 Third Street, Suite 305 San Francisco, CA 94107 phone: 415-555-5000

PATIENT NAME	BIRTH DATE	PATIENT ID NO	COLLECTED	11 01 2010   11:40 AM
Grant, Boyd	1956	9131-10-1	RECEIVED	11 01 2010   11:57 AM
			ORDERED BY	Dr. Beverly Michaels

# 1 About the PSA test

This test measures the amount of a substance called prostate-specific antigen, or PSA, in the blood. The prostate gland releases more of this antigen as you age, but PSA levels can also rise due to an inflammation of the prostate or prostate cancer. While the PSA test is used to screen for cancer, there is debate over whether PSA testing actually reduces your chance of dying from prostate cancer.

# What do your results mean?

The higher your PSA level, the greater the chance you have prostate cancer. However, it's possible to have cancer and a low PSA level. It's also possible to have a high PSA level but no cancer.

So this test is not definitive. The most common problem with the test is false alarms — where the PSA level is high but there's no cancer. Between 65 and 75 percent of men with an elevated PSA level who have a biopsy turn out NOT to have prostate cancer.



ng/ml

prostate cancer

00 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
Normalris	25% chance of prostate cancer				6	7% ch	anceo	forest	ate ca	ncer									

for men ages 50 to 59

# 3 Additional perspective

In the general population, the risk of prostate cancer at your age is about 4 percent and the risk of dying from it is less than 1 percent.

for men ages 50 to 59

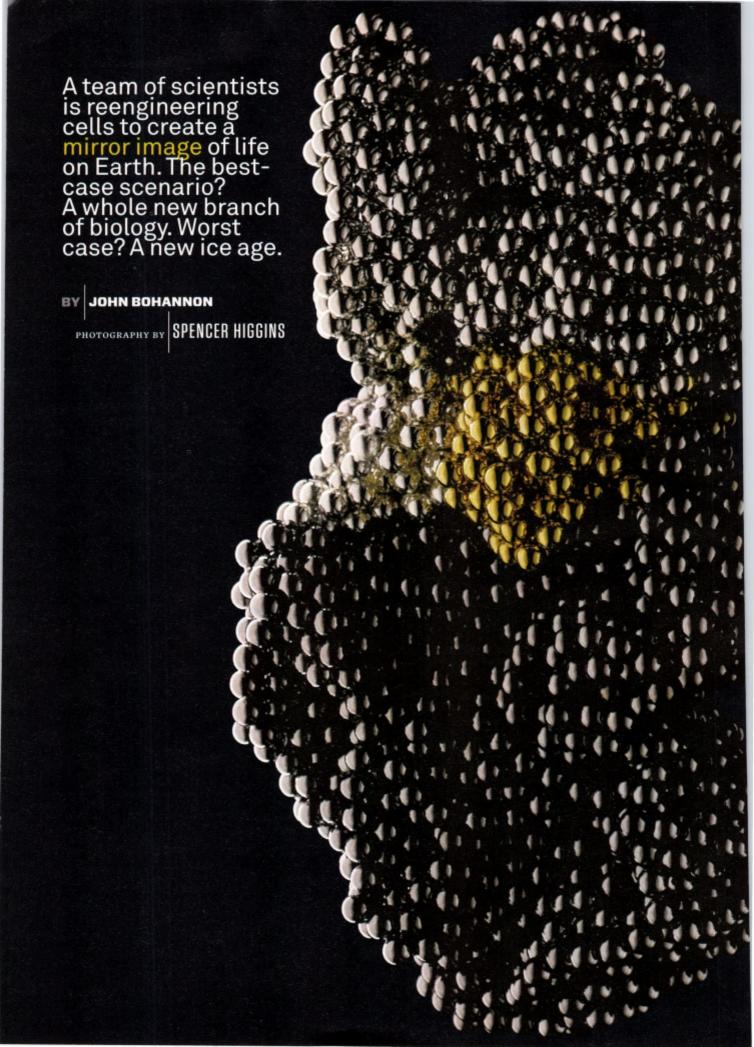


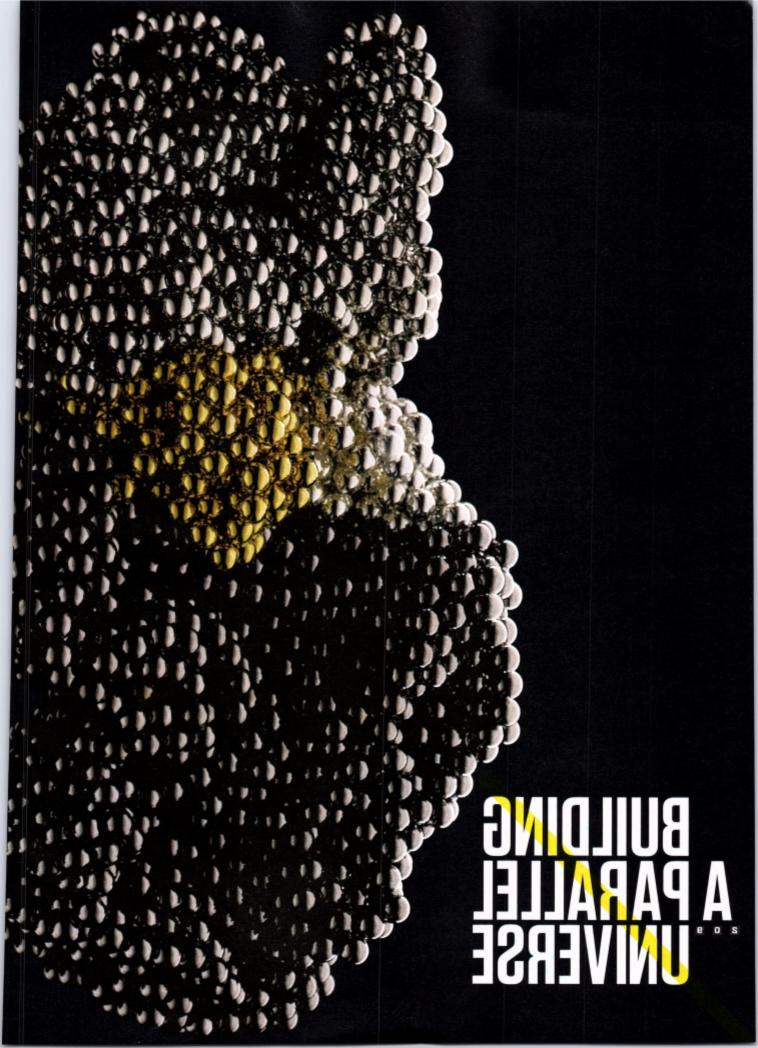
# What now?

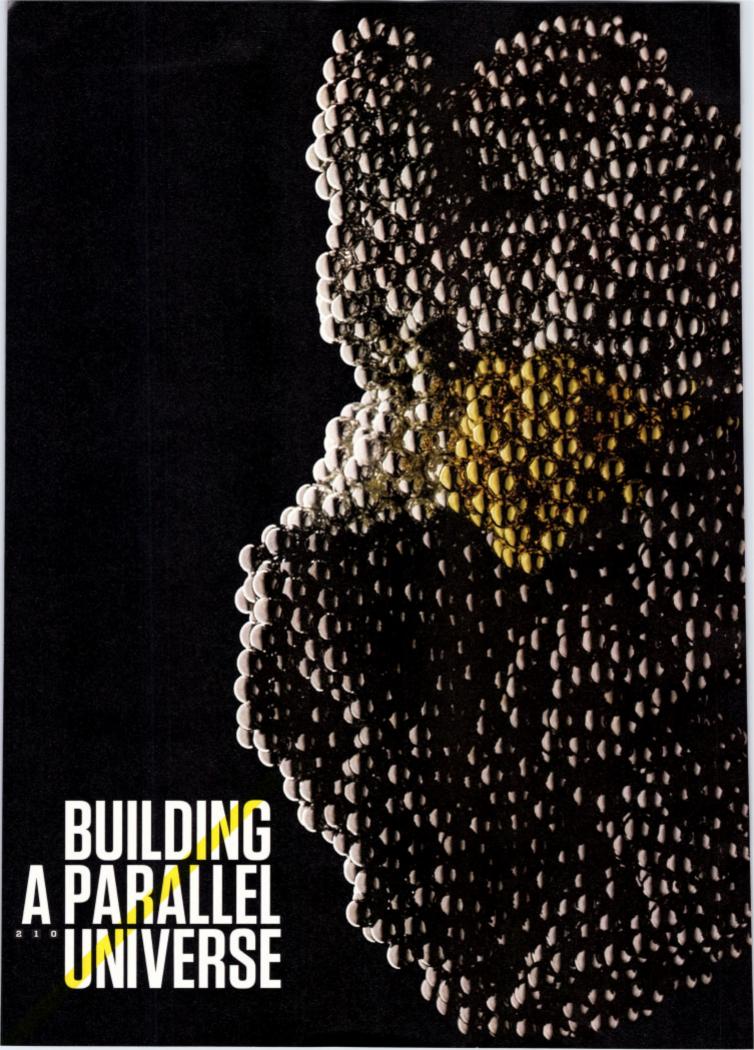
If this was your first PSA screening: Talk to your physician about alternative causes for your elevated PSA level, including benign prostate enlargement, inflammation, infection, age, and race.

If you've been tested previously: Compare your PSA results and talk to your physician about possible conditions other than cancer. Many doctors say a rise of 0.75 ng/ml per year is not worrisome.

Talk to your physician about additional tests, including a digital rectal examor biopsy.







Dimitar Sasselov was at the end of a long day of having his mind blown when the really big idea hit him. Sasselov, an astrophysicist and head of the Origins of Life Initiative at Harvard, was sitting in the front row of a packed lecture hall at the university last spring, listening to the famous human genome sequencer J. Craig Venter talk about his efforts to synthesize new forms of life. Sasselov had introduced the bald, perpetually sunburned biotech entrepreneur at another lecture that morning, and he'd spent the day squiring Venter around campus.

But Sasselov's thoughts were light-years away. Two months earlier, a Delta II rocket had blasted off into the darkness above Cape Canaveral carrying the Kepler space telescope; Sasselov is on the team using Kepler to hunt for Earth-like planets around the Cygnus constellation—looking, ultimately, for extraterrestrial life. And

he was frustrated. Because no matter how much data he and his colleagues collect—gases in the atmosphere, a fingerprint of color on the surfacethey'll never actually see aliens themselves. And that makes it impossible to answer one of the most basic questions of astrobiology: How diverse is life in the universe? If there is life somewhere other than here, does it look like earthly life, with DNA and protein? Or could it run on something else? Venter's lecture about artisanal bacteria mapped suddenly onto Sasselov's frustration. Why not just do what Venter was doing? If Sasselov wanted to study aliens, why not just make them himself-or at least the next-best thing? He imagined himself looking at synthetic aliens on a lab bench, "gazing at the other," as he puts it, "similar to us but not the same." He uncapped his red pen and scribbled a note: "Arrange a mtg/ chat w Jack & GMC," it read. "Chiral E. coli w GMC and put it into a vesicle w Jack & subject two cultures to planetary environments."

Translation: Go to the synthetic biologists Jack Szostak and George Church. Ask them to create a life-form that runs on an operating system different from our own, based on mirror-image versions of earthly proteins and DNA. Let these alien cells grow and mutate, and see how they survive. If it worked, those new cells—Church called them "mirror life"—could answer one of the deepest questions about the origin of life, not just here on Earth but everywhere in the universe. They might also open up new avenues of discovery in materials

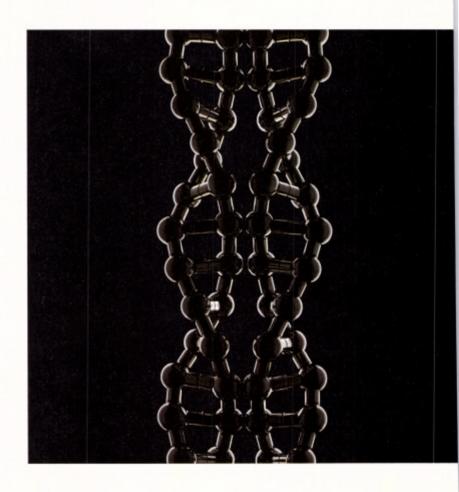
science, fuel synthesis, and pharmaceutical research. On the down side, though, mirror life wouldn't have any predators or diseases to limit its reproduction. They would have to keep an eye on that.

FOUR BILLION YEARS ago was a hellish time on planet Earth. It was the end of the aptly named Hadean eon: Volcanoes spewed lava across rock baked by ultraviolet radiation; asteroids blasted craters into the landscape. But the worst of the bombardment—including the colossal impact that knocked loose the chunk that became our moon—was over. There were oceans of water and plenty of complex organic chemicals. So in some wet place,

maybe near an undersea hydrothermal vent, maybe in the clay on the shore of a shallow pond, organic molecules started to replicate. No one knows exactly where or when or how, but life began.

It was nothing fancy at first. But soon those replicating molecules clothed themselves in a skin of fat, a membrane to keep their complex chemistry from diluting away. And with surprising speed, those bubbles of goop gave rise to a living, functioning cell, the Last Universal Common Ancestor of everything alive today—LUCA. Using the genetic differences between today's living things as a molecular clock, we can calculate when that ancestral cell first emerged: about 3.5 billion years ago.

Since then, life has been busy. At last count, there were as many as 100 million species on the planet, and billions more have gone extinct. And yet, at the most basic level of biochemistry, it has just



been more of the same. Every organism runs on the same operating system that LUCA invented. Peel back a cell's membrane and you'll find a blur of activity, thousands of chemical reactions taking place all at once. The conductors of this biochemical ballet are the proteins, nano-size building blocks and machines that control the speed and timing of every reaction. From breaking down sugars to clearing waste to repairing the membrane, the unique shape of each protein determines its job, as specifically as a lock to its key.

The LUCA operating system was an ingenious solution to keeping track of all those thousands of proteins. Biochemists call it the central dogma: Genetic material, in the form of a long nucleic acid polymer called DNA, stores a digital record of every protein's design. Another nucleic acid, RNA, carries the information to a molecular machine called a ribosome, which reads the RNA and strings together amino acids to form the protein. Once the string is complete, the protein snaps itself into the right shape and gets to work.

But there is at least one viable alternative to LUCA: the mirror image of the entire system. Biochemistry is the story of shapes, and this is its strange plot twist. Lots of molecules come in multiple conformations—sticking together the same atoms can sometimes yield different three-dimensional structures that are the mirror images of each other, a property called chirality. Indeed, most of the basic molecules of life—from the nucleic acids of the genome to the amino acids of the proteins—have mirror-image versions. And all cells have enzymes called isomerases, which flip certain molecules into their mirror ver-

membrane science, and synthetic biology, an ambitious researcher could go beyond theory and build it from the ground up. The tools are here (well, almost here) to make mirror life from scratch.

Sasselov is the ultimate talent scout for a problem like this. Because of his job at the Origins of Life Initiative, he knew George Church was already trying to build mirror-flipped molecular machines that could translate genes into proteins, and he knew that Church didn't have anything to put them in. The membranes of earthly cells are built of fat and protein molecules with the wrong chirality. But Sasselov also knew that if there was anyone in the world who could create a membrane that would work, it was Jack Szostak. "They're both pioneers, but in different ways," Sasselov says. "They are my favorite people, and my mentors."

So he brought them both to a café in Cambridge and made his

pitch: Build a fully functioning mirror cell made of molecules they themselves would synthesize. Or, to put it another way: Don't just create new branches on the tree of life, as Venter was doing with his tweaks of existing cells. Instead, create an entirely new tree.

Church went for it immediately. He'd been looking at similar ideas for years. But Szostak didn't think it would work. "I'm not saying it's impossible," he says, sitting in his office at Massachusetts General Hospital a year after that first meeting. "I'm just saying it requires a lot of hard steps." Nevertheless, he agreed to support the project.

A soft-spoken 58-year-old Canadian with boyish good looks, Szostak won the Nobel Prize last year for his work on telomeres, the protective end caps of chromosomes. He also created the artificial yeast chromosome, critical to advances in DNA cloning and gene mapping. Lately, Szostak has been working on the origin of those membranes that somehow came to enclose and protect LUCA and every cell since. Inside test tubes in his lab float microscopic, hollow spheres of fat-primitive membrane bubbles. Given the right molecular ingredients, they spontaneously selfassemble, grow, and divide, but they're much simpler than a naturally occurring cell membrane. The fatty acids have no chirality; their mirror image is the same molecule. So if they were injected with, say, the guts of mirror life, there would be no wrong-handedness to get in the way.

And that's where Church comes in. He's 6'5", with a gnarly beard and a science fiction fan's optimism. It's his job to build the genome and protein infrastructure for mirror life. But ... could mirror cells actually survive on Earth? "Everything I know from chemistry and physics says that this should work," he says. Then he gets a little silly: "Hey! I know a great shortcut to get our mirror ribosome! I just need a four-dimensional being to pick me up, rotate me in 4-D, and put me back as my mirror self."

Szostak still says he'd bet against their success. The cautious scientist in him can't see how the mirror cell, once full of chirally flipped molecular machinery, will come to life. "Forget about all

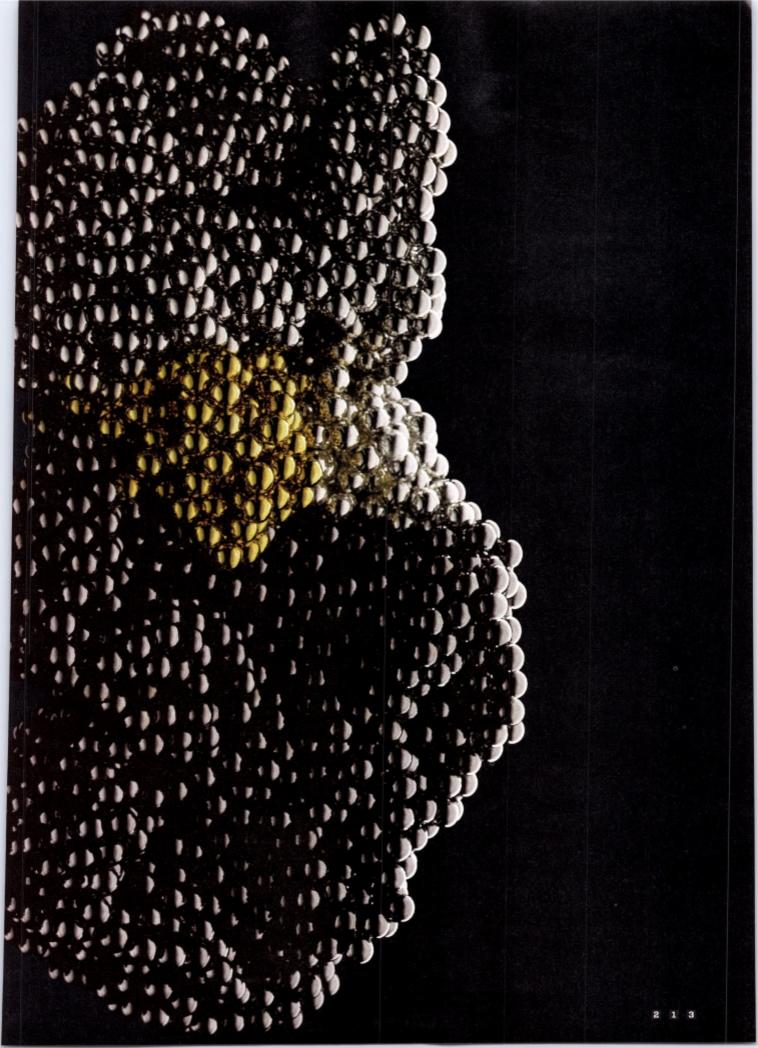


sions. But for some reason, in the machinery of living things on Earth, one side of the mirror goes almost wholly unused. All of us earthlings, from algae to elephants, have proteins made of left-handed amino acids and a genome of right-handed nucleic acids. (When chemists say handed, they're generally referring to the direction that polarized light skews when beamed through a pure solution of the molecule.) No one knows why LUCA picked one side of the mirror and not the other.

test tube.

ror life!

Theoretically, a cell could be based on "wrong-handed" molecules. Its biochemistry would work just like ours—DNA to RNA to proteins—but it would be completely incompatible with earthly life, its chiral twin. And now, thanks to recent advances in genomics, cell



the technical issues of making mirror ribosomes, mirror peptides, and mirror DNA," he says. "The complexity of reconstituting a normal cell, or even a simplified cell with 1,000 components, is mind-boggling. You don't just mix these things up and get it to work." Still, he agreed that if Church got his part figured out, they could use his membranes to keep everything in. Szostak hopes that even attempting to make mirror life could lead to a better understanding of how ribosomes work and cells evolved. He doesn't mention the possibility that mirror life could earn someone serious money.

THE WEEK THAT Sasselov met with Szostak and Church to discuss mirror life, a catastrophe was under way across the Charles River at Genzyme, one of the largest biotech companies in the world. Two of its top sellers—medicines for treating the rare genetic disorders Gaucher's disease and Fabry disease—are proteins. In people with these maladies, fats accumulate in the blood, organs, and brain, causing symptoms from burning pain to kidney failure—unless they get the drugs, produced by genetically modified cells suspended in giant nutrient pools called bioreactors. But that week, a virus that disrupts cell reproduction infected one of the bioreactors. The entire plant had to be shut down.

It was a hard summer for Genzyme, as well as for the people who rely on its medications. While the company decontaminated its bioreactors, thousands of patients around the world rationed their drug supplies. Genzyme's stock price dropped 20 percent.

When Church talks about mirror life's quirky advantages, invulnerability to this kind of mishap is high on his list. "Viruses can't touch a mirror cell," he says. No virus has evolved to infect it. And even if a normal virus did figure out how to get past the membrane of a mirror cell—which usually requires a mechanism that would be thwarted by wrong-handed molecules—the mirror genome would be unreadable to the attacker. Viruses work by hijacking their victims' genomes, taking over the cellular machinery for making proteins to build more of themselves; a normal virus wouldn't have any effect on a mirror cell's factory. This makes mirror life a potential workhorse for biotech.

As it happens, the cell that Sasselov ultimately wants to create a chiral twin of *E. coli*—couldn't make proteins like Genzyme's cells. It would make the chirally flipped versions, which would almost certainly be useless.

But that's not the sort of mirror cell Church has in mind. The problem, he says, is that billions of years of evolutionary R&D have made today's bacterial cells tough, adaptable, and very good at making more of themselves—but inefficient at spitting out designed-to-order molecules in a bioreactor. Church wants a "minimal mirror cell" to produce specific proteins: mirror, normal, and even mixes of the two but far more efficient than a bioreactor full of finicky, genetically engineered cells.

The problem for now is that Church's entire lab is tuned to the wrong chiral setting. Every step on the path to making a mirror cell is blocked by the absence of the right protein tool. The molecule that makes DNA, called DNA polymerase, isn't the right shape to string together wrong-handed nucleic acids. Want to translate those mirror genes into enzymes? The protein machine that makes RNA copies of DNA—it's called RNA polymerase—can't latch onto mirror DNA. And normal ribosomes can't read mirror RNA or string together mirror amino acids.

That's why Church has been hacking the ribosome, the master tool that makes all the rest. His plan is to make one that reads regular RNA transcripts of genes but can string together wrong-handed amino acids to form mirror proteins. "It would be a bridge between our world and the mirror world," Church says. With it, he'd be able to pick a known gene from a library and build mirror protein tools. Chief among them will be a full-on mirror ribosome—no easy task, since the ribosome is a mountain of a molecule, protein and RNA, dating from a time before LUCA. But with a set of mirror proteins, Church thinks he could build one.

None of this will be easy. Messing with the ribosomes inside a living cell can kill it, so Church is going to make ribosomes self-assemble and function in a test tube. And then he'll have to find mutant versions that will accept wrong-handed amino acids. Think of it as switching the sockets on a wrench from standard to metric.

Church and his team have cracked the first step. Though they haven't published their results yet, last year his team got a synthetic ribosome to self-assemble and produce luciferase, the protein that makes fireflies glow. And he has a library of mutant ribosomes that have the right kind of sockets—they'll accept mirror amino acids.

This is where the money comes in. Some of the most valuable drugs are actually tiny proteins that include wrong-handed amino acids—like the immunosuppressant cyclosporine. To manufacture it, pharmaceutical companies have to rely on an inefficient and expensive fungus. A hacked ribosome modified to handle both normal and mirror amino acids could crank out the stuff on an industrial scale. And why stop at what we already know? Being able to produce unnatural proteins cheaply means you could synthesize billions of them and then test them in parallel for antitumor and antibiotic properties. Once you got a hit, Szostak says, you could generate trillions of variations on that molecule, "figure out which are the good ones, and evolve them."

Church thinks even bigger. A manufacturing ribosome would be great, but a fully domesticated mirror cell—able to synthesize more-complicated stuff—would change everything. "All production will be biological," he says. In that science fiction future, vats of virus-proof mirror cells could pump out biofuel, lay down nanosize organic circuitry, and even extrude organic cement foundations for skyscrapers.

**OF COURSE,** mirror life could also kill us all. Synthetic biologists like Church have been thinking about doomsday scenarios for years—the idea that some synthetic super-pathogen will jump a fence. "But that's the beauty of mirror life," Church says. "It can't infect us." Just as viruses from our side of the mirror can't infect it, mirror pathogens can't infect us.

They might be poisonous, though. "I am reluctant to say that the mirror cells or their contents would be nontoxic," says Jerry Kasting, a researcher at the University of Cincinnati who studies the way chemicals interact with human physiology. "But nor would I expect them to be highly toxic." It took evolution millions of years to come up with snake venom proteins that shut down mammal organs. The same goes for microbes that produce toxins like anthrax and botulinum. Mirror molecules aren't tuned to our biochemistry. That's why the 1960s controversy over the antinausea drug thalidomide was such a surprise—the right-handed version calmed morning sickness in pregnant women, but the left-handed version caused birth defects. Usually, though, the mirror image of biological molecules are weaker or have no effect. They can't shake hands with our pro-





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teins. And that would be one of the safety features of mirror life. To a mirror cell, Earth's environment is mostly the equivalent of Olestra, the synthetic fat that human enzymes can't break down. There's just not enough nutrition for them in the wild.

On the other hand, if mirror cells somehow evolved—or were engineered—to consume normal fats, sugars, and proteins, we might have a problem. If a mirror cell got the right set of isomerases to break down these nutrients, that would be a mess. Mirror cells would slowly convert edible matter into more of themselves. Anything that ate them wouldn't be able to digest the mirrored molecules—they'd pass right through predators' guts. And as the mirror cells excreted waste and died, the accumulating material would be like a self-generating oil spill with nothing to clean it up.

It gets worse: If mirror cells acquired the ability to photosynthesize, we'd be screwed. "I suspect that all hell would break loose," says Jim Kasting, a climate scientist at Penn State University and an expert on the global carbon cycle. (He is also Jerry Kasting's chiral twin brother; Jim is right-handed, Jerry is left.) All it would take would be a droplet of mirror cyanobacteria squirted into the ocean. Cyanobacteria are at the base of the ocean's food pyramid, converting sunlight and carbon dioxide into more of themselves. After doing some rough calculations on the effects of a mirror cyanobacteria invasion, Jim Kasting isn't sure which would kill us first—the global famine or the ice age. "It would quickly consume all the available nutrients," he says. "This would leave fewer or perhaps no nutrients for normal organisms." That would wipe out the global ocean ecology and starve a significant portion of the human population. As the CO, in the ocean was incorporated into inedible mirror cells, they would "draw down" CO, from the atmosphere, Kasting says. For a decade or two, you would have a cure for global warming. But Kasting predicts that in about 300 years the bugs would suck down half of Earth's atmospheric CO., Photosynthesis of most land plants would fail. "All agricultural crops other than corn and sugar cane would die," he says. (They do photosynthesis a little differently.) "People might be able to subsist for a few hundred years, but things would be getting pretty grim much more quickly than that." After 600 years, we'd be in the midst of a global ice age. It would be a total evolutionary reboot both Kasting and Church think mirror predators would evolve, but whatever life existed on Earth by that point wouldn't include us.

"I would be the first to say that we shouldn't make a photosynthetic mirror cell," Church says. "But I'm reluctant to have a moratorium on something that doesn't exist yet." He says he'd build safeguards into his mirror cells so they'd perish without constant care. And the advances in synthetic biology required to transform those first delicate mirror cells into anything that could survive in the wild are even more remote.

**EARLY EARTH SEEMS** to have been covered in a soup of organic molecules with no chiral preference. One plausible theory for where they came from: space. In 1969, a meteorite fell on Murchison, Australia. The 4.6 billion-year-old rock is a sample of the solar system from before the birth of our planet. Not only does it carry both right- and left-handed versions of normal amino acids; it also contains dozens of exotic amino acids that life ended up not using at all. This material was pummeling the surface of Earth right through the Hadean era. But that doesn't explain why LUCA chose our side of the mirror. It could be that the primordial soup wasn't equally spiced with

both versions of the molecules. Stars sometimes emit polarized light that selectively breaks apart one version or the other of a chiral molecule. In fact, the Murchison meteorite contains a slight imbalance between the right- and left-handed amino acids, with an excess of the kind that got used by LUCA. (Scientists are convinced that it isn't due to earthly contamination.) So it's possible that the sun destroyed the wrong-handed amino acids, denying mirror life its construction materials before it could get a toehold on this planet.

Or the game may be rigged. There might be something more fundamental about our universe that prefers our side of the mirror. But if so—a possibility that thrills Sasselov—the physics behind it is unknown. His new cells will provide the test bed for that hypothesis. "We'll use the mirror cells as the basis of the assay," he says. "We can use them as an amplifier." He'll grow colonies of normal cells and mirror cells under the same conditions. If the mirror cells aren't exactly as healthy or fertile as the normal ones, he'll know something weird is going on. Even the tiniest bias in physics will show up as a big difference after thousands of generations.

Sasselov has another, even stranger experiment planned. If it works, it will ruin Church's hopes for virus-free biotechnology but might earn all three researchers the Nobel Prize. "It'll be a revolution in our understanding of life and its place in the cosmos," Sasselov says. The short version: He's going to try to find mirror life that's already living on Earth.

In the traditional story of the origin of life, the chances of evolution producing a living cell are vanishingly small. LUCA was a lottery winner. But it could just as well be that life is easy—something that just happens in environments like those of early Earth. In this version of the story, the primordial soup was a party. There were plenty of resources, few rules, and all manner of bizarre cellular characters. LUCA was there—and so was LUCA's mirror twin. And maybe even stranger versions of life, too.

We know how the party ended. LUCA went on to become the dominant colonizer of the planet, evolving into billions of species great and small, including a midsize naked ape that likes to read magazines. But what if some of those other partygoers stuck around? Strange life-forms might be living undetected because we've never thought to look for their chemical traces. They might live in extreme places, at the bottom of the ocean or inside the pores of rocks—a "shadow biosphere" that's been here all along, eking out a quiet living. Just as Sasselov worries that astronomers have defined the signs of life too narrowly, maybe we don't know what to look for right here at home.

If mirror life-forms do exist, Sasselov knows one thing for sure. "They must have their own viruses," he says. "That's just a fact of life." And that's how he'll trap the shadow biosphere. "We can use mirror cells as a honeypot," he says. Earthly mirror viruses might mistake synthetic mirror cells for their usual prey, come out of hiding to infect them, and then snap! He'd close the lid of the petri dish. Rather than going hunting for mirror life, Sasselov would coax it into the light.

Kepler has already spotted hundreds of Earth-like planets— Sasselov estimates that there are 100 million habitable worlds in our galaxy. Odds are we'll never visit them. But if Sasselov is right, then the "aliens" could be here already, and they might be older than LUCA. If so, mirror life isn't just here. It's us.

JOHN BOHANNON (gonzo@aaas.org) wrote about a proteinfolding game in issue 17.05

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#### Return to Cyberspace

screenwriters, animators, and programmers. They're the ones who reintroduced *Tron* to popular culture. It's no accident that when Matt Stone and Trey Parker, the master satirists behind *South Park*, wanted to parody the idea of being "sucked into Facebook," the episode became an extended *Tron* riff. Or that when *30 Rock*'s Liz Lemon found her dress glowing under a blacklight at a cast party, she joked that she was going to go fight Sark like in *Tron*. "I owe a real debt to the Gen Xers," Lisberger says. "That's who embraced *Tron* and took it to heart."

Sean Bailey, now head of production at Disney studios, was 12 years old when his father took him to see Tron. Sure enough, the images instantly embedded into his subconscious: those illuminated costumes and cold laser lines didn't look like any other movie. Bailey grew up to become a filmmaker himself, eventually working with Matt Damon and Ben Affleck. In 2005, he was tasked by Disney to reboot Tron. "The first big meeting I had at the studio, I said, 'Here are three things I think we have to have to make this movie: The screen has to look unlike anything you've ever seen before. We need Jeff Bridges. And we need light cycles.""

Making a new *Tron* may have been less risky than trying something brand-new, but familiarity doesn't write scripts. All Bailey had, really, was a resonant title and a few images. "People talk a lot about built-in brand equity and those kinds of things, but I think with *Tron* it's a little different," he says. "It was a really forward-thinking movie that for a variety of reasons kind of missed the mark commercially."

Bailey teamed up with Adam Horowitz and Edward Kitsis, coexecutive producers on Lost. The duo was key in the dispensing of Easter eggs throughout the series, sneaking in winking references for the show's disciples—a useful talent if you're trying to connect a new movie to an old one. And they loved *Tron*. On their first gig, a TV show called *Popular* (made by the creator of *Glee*), they'd written an entire *Tron*-themed episode. When they signed on to write the film, Kitsis recalls, "the first thing we thought of was that we didn't want a remake, because *Tron* was awesome."

What they came up with was a sequel, a father-son story—Kevin Flynn, Jeff Bridges' character from the first movie, has disappeared into the Troniverse, and his son, Sam, has to go in to find him. Meanwhile, a younger, eviler version of Flynn, named Clu, has taken over the game grid. It worked for Bailey, but none of them knew if it would be technically executable.

That's where Joseph Kosinski came in. Trained as an architect and aerospace engineer, he had come to Hollywood's attention for a series of TV commercials that were slickly digital but didn't look it. During one of their early meetings, Bailey asked Kosinski: "In the post-Matrix era, how do you make a sequel to Tron?" Kosinski proposed keepAnd if Lisberger and Bridges didn't buy in, poof, there goes their first movie. So they pitched: There's an old you and a young you in the *Tron* world, and the young you is the bad guy, and you have a son, and—

Bridges all of a sudden stood up, excited. 
"Hang on," he said and disappeared into another room. He came back carrying the helmet he wore in the original. "Let's take a walk," he said. At which point he made everyone stroll around the property, taking pictures of one another wearing the helmet. 
("One of the great meetings," Bailey says.) Bridges and Lisberger were in.

Now the team could do what it had promised from the beginning—exactly what Lisberger had done 25 years before in the same situation: Kosinki would shoot a test clip to show the style and approach of the film he'd like to make, an increasingly common strategy for first-time directors. And then Bailey and the team came up with a plan. Instead of just shooting a test, they decided that they'd make something good enough to show outside the studio. Bailey got Disney to pony up development coin, and Bridges agreed to appear.

They finished the test reel in March

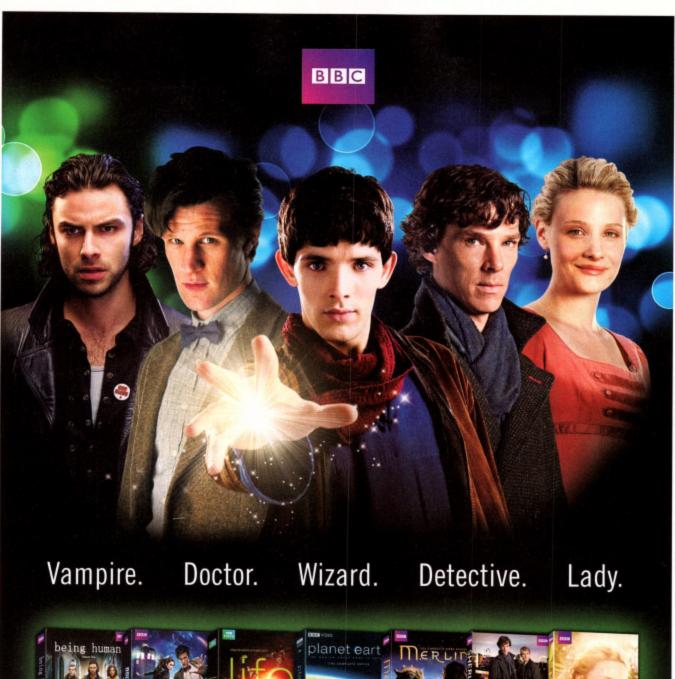
# "The screen has to look unlike anything you've ever seen before. We need Jeff Bridges. And we need light cycles."

ing the characters and building a mythology that connected 2010 to 1982. It was a ballsy approach that meshed with what the writers were already working on. Kosinksi was hired.

So that left just one last tricky bit: convincing Lisberger and Bridges. Lisberger had been kicking around Disney for decades, trying to get a remake or sequel made. But his ideas had become increasingly distant from the source material. And Bridges? He was on his way to winning an Oscar for Crazy Heart. Tron was a B movie from before he was famous. So in 2007, Bailey set up a meeting with Bridges, Lisberger, and the whole crew: coproducer Justin Springer, Kosinski, Kitsis, and Horowitz all trooped to Bridges' house in Montecito, California. Kitsis and Horowitz were thrilled—they were about to meet two of their heroes.

2008, early enough to suggest showing it at Comic-Con in San Diego. "This place was not entirely comfortable with the idea," Bailey says. "A little bit because the movie wasn't green-lit yet, but more like, why are we going down and showing something when we don't know how it will play?" Bailey and Kosinski were pretty sure it'd play to the hearts of the Comic-Con crowd (and if it didn't, they weren't making the right movie). "From a more Machiavellian perspective," Bailey says, "I was thinking, well, if they show it and it plays, there's not going to be a lot of turning back."

It played. Oh, it played—and it deployed every tool Bailey said the movie would need. The production design was original but clearly looked like the first *Tron*. Bridges' appearance produced paroxysms of cheers





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from the 6,500 nerds in Hall H. Light cycles banged into each other. Disney gave the movie a green light.

Kosinski finished shooting Tron: Legacy in June 2009 and quickly began postproduction. Since then, Disney has released two trailers and leaked dozens of images. It has run alternate-reality games that started as websites based on characters and companies from the movie and then exploded, spewing into mock-ups of the film's sets at Comic-Con or played-as-real press conferences where actors from the original Tron perform as their characters. Fragments of imagery and sounds from the movie have been processed and recapitulated at fashion shows and live concerts. Even in the throes of postproduction, the actual movie lived inside computers ... but it was trying to get out.

The screening room at Digital Domain is a little tattered-concrete floor, ratty reddish rug, four rows of threadbare stadium seats. But the screen is big, the sound is good, and the projector is equipped for 3-D. Mounted in the middle of the front row is a console with a small button in the center. "Anytime we're in here and I see a shot I like, I hit this button," Kosinski says. He presses it and a bell rings as if it were recess. A sign over the upper left corner of the screen blinks on and off: FINAL. At one side of the room, Eric Barba, the visual effects supervisor, laughs ruefully. Three months before release, he has a wall of index cards representing unfinished shots. Maybe he'd like to see that sign light up a little more often at this late date.

Kosinski has about 25 minutes of film that he's willing to show, some of it finished and some of it still wireframe. A sleek, sexy Jeff Bridges-young, with poufy '80s hair and chiseled abs, who could plausibly have sex amid Mayan ruins, like in Against All Oddssprays menace all over the place. Modernday Jeff Bridges, the weathered, huskier 2010 iteration, could probably do a range of menace in a single take, from a light dusting to let's-just-open-the-spigot. It requires considerably more effort to get the rejuvenated version to do the same bit of business. The body in the tight black jumpsuit with orange piping is real, but the head is entirely digital-a near duplicate of the 1980s-era Bridges that the animators call Rev 4. It has

taken hundreds of digital artists two years to create this simulacrum. They spend days in darkened rooms, row after row of cubicles decorated with stills of Bridges, like a creepy teenage girl's bedroom, tweaking the corner of his mouth and the reflections of light in his eyes—and this is a movie with a lot of reflecting lights. In the completed scenes, Rev 4 is nearly indistinguishable from real even close up—you can tell it's CG only because you know it's CG.

Whatever else happens, the movie is really pretty. The light cycle battle, an 8-bit maze of luminous color blocks and right angles in the first movie, has been turned to crystal—motocross by way of Harry Winston. Now five yellow cycles race against five blue, curving and arcing across three levels of transparent ramps, roads, and spirals and leaving icy, glowing walls behind. When characters are killed, they shatter into thousands of glittering cubes.

So Tron: Legacy doesn't look like Tron. Nobody would really want it to, frankly, and anyway, technology has moved on. What counted as cinema-quality for Lisberger back in the 1970s looks like what Kosinski's team sketches with today. "Our pre-viz looks like wore to translate his facial movements to Rev 4 included a visor that looked uncannily like the helmet he wore in the original. And the prospect of an unimpeachable, photorealistic avatar for Bridges ought to make the Screen Actors Guild freak out. In fact, a flashback sequence featuring flawless, CG youth-enized versions of both Bridges and Bruce Boxleitner as the eponymous hero sparks a burst of laughter from Kosinski: "Oh! I know what my next project is going to be," he says. "A 1980s buddy cop movie with young Jeff Bridges and young Bruce Boxleitner!"

What really connects the old *Tron* to the new is a certain grandiosity, a feeling that big thoughts are being thunk amid all the shiny lights. The narrative links are fun—the discombat arena in the new movie unfolds with a sound from the old *Discs of Tron* arcade game. Sam Flynn's first words upon entering the Troniverse in *Legacy* echo Kevin Flynn's line from the same moment in the original. It's the themes, though, that make a movie like this into something more than popcorn. Lisberger still thinks that cyberspace is a mirror of the human soul; Kay says its a window to other worlds. *Tron: Legacy* should

# The body in the black jumpsuit is real, but the head is entirely digital—a near duplicate of the 1980s-era Bridges.

the original film," Kosinski says. "I wanted this to feel like we took cameras into the world of *Tron* and shot from the inside." This echoes what Peter Jackson once said about Middle-earth. But nobody had ever been to the Shire to say whether the vision was accurate. Today people think they've been to cyberspace. Whether it's Facebook or Azeroth or the virtual Afghanistan of *Modern Warfare 2*, everyone has already lived inside the Troniverse.

All those artists at Digital Domain know they're creating *Tron*'s reality by creating it *in reality*. "We've achieved what the first film predicted," Kosinski says. Jeff Bridges had to get a full-body laser scan during preproduction, an eerie hearkening to his digitization in the first movie. When he shot his scenes as Clu, the motion-capture rig he

make us do more than look at a beautiful new Bridges and think, my God, what have we done? And the filmmakers are, to their credit, giving it a shot. "After a lot of deep, late-night pizza-and-beer conversations, we thought there was a pretty interesting notion in that not being a one-way street," Bailey says. "That world is coming into ours, too." An interesting notion, if they can pull it off. Because even the cheesiest science fiction, like cyberspace, should be both window and mirror. It shows us where we're going and who we are.

Or, failing that, it should give us light cycles.

Senior editor ADAM ROGERS (adam\_rogers @wired.com) wrote about the Watchmen movie in issue 17.03.

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#### The Coupon Rebellion

floor. "Please slow me down if there's anything you don't understand. You'll see that I'm putting my coupons in two stacks—one for those that double, one for those that don't."

Next comes a bag of cherry tomatoes and three jars of Peter Pan creamy peanut butter, free with a doubled coupon—called a blinkie because it was dispensed from one of the blinking coupon boxes installed in grocery store aisles. This particular coupon came "Customer service to 6!" Jennifer announces, leaning into her microphone.

"If you save over a certain amount, they need to get an override," Harrison says. She twists her beaded bracelet as the groceries scan, her face taut with the bridled anticipation of a card counter cashing in chips.

"The total is \$1.77," Jennifer says. "You saved \$78.15." Harrison pays, scrutinizes the receipt, and then picks up her bags and walks over to the customer service counter. The red bell pepper, priced at \$1.99, has erroneously rung up at \$2.79 plus tax. Harrison explains this error to Michael W., who, per Harris Teeter policy, reaches into the drawer and gives her a \$2.85 cash refund.

"I actually made money on this trip," Harrison says, beaming as she heads for the door. "A dollar and eight cents." Outside, she begins transferring the day's haul into the back of her Hyundai Tucson. First she has to clear away a cache of Nestlé Aquapods—\$3 on sale from Food Lion, yielding a \$3 Aquaneyman to Grand Master. These ranks are earned through such painstaking labors as scanning newspaper inserts, compiling data from these ads into easy-to-read text, and posting deals that moderators deem worthy of inclusion in the Hot Deals forum.

The users themselves are as diverse as the sites they populate and the stuff they buy. Jeffrey Tan, whose nearly 44,000 posts as yuugotserved make him one of SlickDeals' top contributors, is an 18-year-old college freshman in New York City who spends an hour or two every morning skimming and posting new deals from Newegg.com, Dell .com, and Sears.com. The user Slowtech oversees a team of people who reply to queries and write up summaries of threads related to Target. Cathy Zeiler, aka ladycat, accesses SlickDeals daily through her dial-up modem. Once a week, she fills her minivan with groceries and distributes them to as many as six low-income and out-ofwork families near her home in Wichita Falls,

Texas. "I always did sales, but not like this," she says. "The Internet gave me the resources to take it up a few levels."

In some cases, retail hackers take an attitude toward their targets that is literally paramilitary. Every year, Dev Shapiro, the 31-year-old moderator of the Black Friday boards at GottaDeal.com, plots a map of his own favored prey, the Best Buy store a few miles from

his house. Starting as early as the Monday before Thanksgiving, a full 100 hours in advance, Shapiro arrives at the store to set up his base camp: tent, propane stove, rented Porta Potti. ("I charge a buck a dump," he says. "It pays for itself.")

Using live recon from inside the store and information gleaned from GottaDeal-which starts posting leaked Black Friday circulars from major retailers as early as Augusthe draws up a plan of attack. He merges his personal shopping list with those of several friends, who join him during the final hours of his vigil. When the doors open, his team moves with the deadly swiftness of a Special Forces raid-one man to the laptops, another to GPS systems, another to the DVDs, another to the Blu-rays, and so on. One year, Shapiro brought home three GPS units, a digital camera, four laptops, three flatscreen TVs, and several gigabytes of RAM-nearly \$10,000 in merchandise at face value, for less than \$1,500. "Black Friday is all about information and advance planning," Shapiro

#### "You'll see that I'm putting my coupons in two stacks—slow me down if there's anything you don't understand."

from a nearby Food Lion. The barcodes on the Food Lion blinkies start with 5, Harrison explains, and these will double this week; the Harris Teeter blinkies start with 9, and these won't double.

In aisle 1, Harrison grabs a can of Hanover kidney beans, free with a coupon Hanover sent her after she left a positive comment on its website—a gesture she tries to make for some company every day. Her envelope contains seven more coupons obtained through online compliments, as well as four from a ConAgra Foods booklet, 13 clipped from newspapers, and one Internet coupon found via a post at Hot Coupon World.

Harrison is moving quickly now, like a Pac-Man master running patterns through the maze. The envelope emptied and the cart filled, she pulls up to register 6 and a familiar face, Jennifer K., an associate in her early twenties.

"You want me to send 'em down?" Jennifer asks, as Harrison loads the conveyor. "Yeah, I'll bag for you," she replies. pod coupon, which she rolled a couple of times. Facing Harrison's van is a black SUV. A toddler waits in an empty shopping cart while her father loads groceries into the backseat, too busy to notice when his cart—and child—begin to roll slowly, then faster, down the parking lot's gentle slope toward a parked car. It takes less than three seconds for Harrison to assess the scene, dart past the front of her Tucson, and make the save.

"Happens to me all the time!" she says to the father before he has time to thank her.

There are millions of Michelle Harrisons out there, finding one another—and training one another—through the vast online network of deal-hunting sites: GottaDeal, RetailMeNot, Buxr, Hot Coupon World, WeUseCoupons, and many, many more. On the largest of these, SlickDeals, users flock to subforums that trade deals and tricks for every major national or regional chain. Users collect reputation points and move up through 10 levels—from Learner to Jour-



# **FAKE LOVE**

A FILM BY AARON ROSE FOR INCASE

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**NINCASE** 

says. "You have to know where to be when."

Shapiro's take-no-prisoners approach to shopping is, on one level, a holdover from his profession: He makes his living as "director of logistics and intelligence" for Congregational Security, a Dallas-based firm that specializes in protecting places of worship from terrorism and financial crimes. Shapiro's job, as he describes it, is to analyze threats. He speaks Hindi, Hebrew, and Arabic, which he uses to scan online message boards frequented by al Qaeda. He says he has worked with former Mossad officers to train parking lot greeters and arranged for bomb-sniffing dogs to scour the hotels of visiting foreign dignitaries. Most of this work happens at a desk a few feet from a rumpled Ikea bed in his parents' ranch house in suburban Dallas, a life that seems equal parts James Bond and Seth Rogen. "I get to play with cool toys, and I get to learn," says Shapiro, who has received training in 9-millimeter combat shooting and tactical driving maneuvers. "My job is about being prepared."

But the hyper-disciplined assault is also, increasingly, the approach taken by all online deal hunters—everyone from college students to urban professionals to suburban mothers like Harrison. With anxieties aggravated by the recession and amplified online, they are exploiting information and employing coordination to dictate what they want to buy, how they want to be treated during the transaction, and what they're willing to pay.

Until recently, coupons have almost always been designed to advance the interests of sellers, not buyers. As structured by retailers and manufacturers, coupons will offer the minimum economic inducement necessary to spur the sale. Perhaps the most revolutionary aspect of the Groupon model is that it begins with the collective buying power of the audience, whose sheer numbers-and proven eagerness to buy-give the startup enormous leverage with retailers. As a result, Groupon and its competitors are reimagining the coupon as a tool for dragging prices down to unprecedented lows-not a few bucks off a single product but 50 percent off restaurant bills, haircuts, museum tickets, and jeans from the Gap. Groupon keeps a full half of this halved price; the benefit to the vendor comes from exposure on Groupon's voluminous email list, as well as the rush of new customers who will

flood through the door, Groupons in hand.

For vendors, the hope is that enough of these deal seekers will convert into regular buyers to justify giving up three-quarters of the revenue from their first visit. For customers, though, it's a whole new way to look at shopping. It encourages impulsiveness and experimentation, harnessing the ever-shifting, gamelike terrain of the online dealscape, offering users not just

businesses, for their part, have complained that Groupon represents consumer interests too aggressively, attracting hordes of deal-hungry customers who never appear again. Some users are complaining, too—of long lines at events and small businesses that can't handle the surge in traffic. But Groupon is trying to address both of these issues, allowing merchants to set a cap on the number of Groupons for each deal and

# Groupon and its rivals are reimagining the coupon as a tool for dragging prices down to unprecedented lows.

a collective price but a collective buying experience. After purchasing a Groupon, users can return to the site and trade stories of their adventures in retail. They get the same cycle of communal chasing and gloating offered by sites like SlickDeals and GottaDeal without the hard work of tracking down deals and negotiating prices—Groupon's sales team handles all that.

Andrew Mason, Groupon's CEO, doesn't have an office. He roams around the company's downtown Chicago headquarters, which are spread across multiple floors of a converted warehouse on the Chicago River. Even as Groupon has grown to nearly 2,700 employees (and a mammoth valuation of more than \$1 billion), Mason has kept his corporate culture even more casual and ostentatiously weird than his Silicon Valley counterparts. When I visited the offices, managers were leading a group of new employees through an elaborate alternate-reality game that involved cutting open teddy bears with knives. The game even has its own office, at the end of a row of sales staff—a place called Michael's Room, containing a bed with scorched blankets and a toilet filled with candy.

As divergent as such stunts might seem from Groupon's core business, Mason believes they share an essential aesthetic—they're "purposefully random." To his mind, the most effective coupons aren't the ones that save you money on things you'd buy anyway; they're the ones that come from out of nowhere, giving you license to buy something you otherwise wouldn't. Some

refunding money to dissatisfied customers.

Because Groupon does all the work for its users—finding the business, negotiating the deal, delivering the coupon—it doesn't cultivate in its users the expertise of deal hunters like Shapiro and Harrison. Groupon users are not hackers; they're ordinary consumers who, instead of performing their own laborious research, trust Groupon to act as an honest broker on their behalf. This isn't so different from the traditional retail model, in which the consumer is dependent on the vendor and happily buys whatever's on sale.

It's easy to imagine this pointing toward a brighter future, with the technologically enhanced, customer-friendly coupon siphoning larger and larger shares of promotional budgets directly into consumers' pockets. One can also imagine an alternate scenario, where deep-discount online coupons turn into a last-ditch measure for businesses that can't draw enough traffic with their asking price. Larger retailers could even grow wise to the latent tracking possibilities of online coupons and comb purchase histories to further manipulate our behavior. But regardless of how this technological arms race ends, it's clear that the old method of unilateral pricing, with consumers groping around in the dark for the real discount, can't possibly survive. The deal-hunting horde has the tools to ensure that no bargain stays secret for long. U 

MATT SCHWARTZ (mattathiasschwartz .com) wrote about a Korean financial blogger in issue 17.11.

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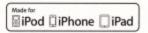
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Insane Clown Posse

from ICP's worn formula of righteous violence and sixth-grade sex brags, and whatever plot points these songs contain are either dog-whistle faint or nonexistent. Yet the Carnival's inscrutability has only drawn fans deeper, and its long-form arc was seemingly made for the Internet, where Juggalos devote entire websites to the Dark Carnival, looking for clues in ICP's steady stream of blog posts. Whether one sees the Carnival as a feat of proto-21st-century storytelling or simply a long-con gimmick-in truth it's probably both-it's proven to be an inexhaustible franchise. To Juggalos, the Carnival's cartoon mascots are as iconic as the Grateful Dead's dancing bears or Iron Maiden's Eddie, and they're emblazoned on everything from ski masks to lighters (of course, even the Greatful Dead and Iron Maiden don't have anything like the ICP Dark Carnivalthemed board game The Quest for Shangri-La). Not surprisingly, after the first series of cards was exhausted-a process that took six albums and 10 years-ICP announced the beginning of a second Joker's Deck.

For those who'd been paying attention to the Dark Carnival all along, the thinly veiled spirituality of "Miracles" made perfect sense. On "Thy Unveiling," a song from 2002's The Wraith: Shangri-La, ICP revealed that the Dark Carnival—much like Lost—was all about finding heaven: Truth is we follow God./We've always been behind Him./The Carnival is God, and may all Juggalos find Him! "I was raised to believe there was a God, a heaven, and a hell," Bruce says. "We got the ears of all these Juggalos. What do we want to say? We wanna say, 'Go to heaven. Don't fuck up.' I wanna see Juggalos in the afterlife."

To get an idea of what Juggalo heaven would look like, you must burrow through deep woods to an isolated campground at Cave-In Rock, an aptly named village near the Illinois-Kentucky border. After several long, desolate stretches of road, all tethers to the outside world start to break away: Cell phone bars shrivel to mere nubs, like an unfinished game of hangman. Luckily, to find the Gathering of the Juggalos, all you need to do is listen for the whoops. They can be heard from the edges of the campsite and come in three varieties:

"Whoop-whoooooUP!" The longest, most celebratory whoop heard at the Gathering, often performed en masse. It usually denotes a special occasion, such as a Psychopathic artist walking through the crowd or a woman removing her top.

"Whoop-Whoop!" The most common whoop, one heard frequently as Juggalos pass one another in large groups on foot or in rented go-carts.

"Whoopwhoop." A slightly less enthusedsounding whoop, its force hampered by the effects of drowsiness, sunstroke, or weed.

Despite the constant auditory stimuli, the Gathering is, in some ways, aggressively mellow. This is a bit of a revelation, given that an ICP-sponsored documentary, A Family Underground, portrays the event as a cavalcade of backyard wrestling brawls and partial nudity. These do exist, as does an open narcotics market, called the Bridge, where revelers peddle everything from pot to ecstasy to coke (the park is private property, so no cops are allowed). And things get more ominous at night, when the combination of drugs, face paint, and rented wheels turns the Gathering of the Juggalos into something resembling a Cormac McCarthy-designed game of Mario Kart.

But at times the event is downright family-friendly. During the day, Bruce emcees a Beach Boys-themed dance party. Entire families line up to get ICP jerseys (and even pregnant bellies) signed at the autograph tent, while Juggalos cavort on a dock atop a body of water so nastylooking that it's been dubbed Lake Hepatitis. And of course there's the music, with artists like Naughty by Nature and Warren G (plus the occasional throwback like Vanilla Ice or stand-up comic Gallagher) performing late into the night. And if you get bored, you can always look for the kid with the sign that reads will Eat Bugs for \$\$.

Despite a sizable population of female fans (dubbed Juggalettes), ICP's following is made up mostly of young white men from working-class backgrounds. They tend to

feel that they've been misunderstood outsiders their whole lives, whether for being overweight, looking weird, being poor, or even for just liking ICP in the first place. It's a world where man boobs are on proud display, where long-hairs and pink-hairs mingle, where nobody makes fun of the fat kid toweling off near Lake Hepatitis. For them, the Gathering is a place they can be accepted, a feeling reinforced by the constant chants of the Juggalo credo "Fam-uh-LEE! Fam-uh-LEE!" "You're surrounded by people who love you," says Corey Lewter, a 23-year-old from Algonquin, Illinois. "Even though we've never met each other, we all relate." Adds Nick Wolff, a 20-year-old prep cook from Willowbrook, Illinois, "We're all family, no matter what race, color, weight, whatever."

Like most Juggalos, Wolff and Lewter began listening to ICP as teenagers, and anyone perplexed by the band's continued success would do well to recall just how alienating those years can be. Bruce and Utsler haven't forgotten this pain. Though the Gathering hosts a massive merch tentcomplete with \$350 leather jackets and an on-site ATM-the group is really selling an off-the-rack social identity: instant entrée to a band of outsiders. It's an image ICP pushes constantly, pimping otherness with its most hated band T-shirts and middleof-nowhere confab, and it's undoubtedly the single biggest factor in ICP's success. With so many artists pitching a lifestyle of aspirational fabulosity, ICP extols the virtue of average-shmo egalitarianism, even if the actual ICP members don't live an entirely down-and-out life these days.

Put all of these outsiders together with a heaping dose of us-versus-them and you have a tried-and-true formula for creating an insular subculture—just ask any teapartyer. And at the Gathering there really is a sense of unity. Until there isn't.

Late on the second night of the festival, reality TV star Tila Tequila makes an appearance on the Gathering's "Ladies' Night" stage. Throughout the day, there were rumors that Tequila was going to be attacked by the crowd—despite Bruce and Utsler asking everyone to leave her alone. Yet within minutes of taking the stage, Tequila is pelted with debris, chairs, and even feces from an outhouse. She removes her top, hoping to win over the crowd, but is forced, after being bloodied, into a retreat. The event played out on TMZ and MTV for days.

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Why was Tequila persecuted while the likes of Vanilla Ice were cheered? It's hard to say. Some claim Tequila was mocking ICP on her Twitter feed by spelling clown with a k. Others see her presence as evidence that the mainstream-after years of not caring about what the Juggalos did out here in the woods-is intruding upon the Gathering, either to poke fun at it or to figure out how to market to it. But the truth is, for the ICP formula to work there has to be a "them"-and in this case, them is an admittedly grating (but thoroughly harmless) publicity seeker, one who maybe acts a little too much like the girl who wouldn't date you in high school.

The incident presents an interesting dilemma for ICP, especially as its profile increases: The Gathering is intended as an open-tent party; in fact, that all-inclusiveness might be its biggest draw, greater even than the music and the drugs. So what happens when the crowd gets too unruly? If Bruce and Utsler start telling Juggalos what they can and can't do, they risk coming off like just another set of uncaring adults. Bruce waves off such concerns. Just because he and Utsler created the Juggalos doesn't mean they have the power to control them. "We don't lead them," Bruce says. "Juggalos lead us."

Two weeks after the Gathering, Bruce is guiding his black SUV through downtown Detroit, pointing out sites from ICP's history. We pass through the city's southwest neighborhoods, where ICP—then called Inner City Posse—got its start in the early '90s. With each block, the urban landscape becomes more grim: A brand-new chain pharmacy gives way to homes that have been hollowed out by fire, leaving behind nothing but piles of rubble and a few brick walls. As we drive, rare Michael Jackson ballads trickle from Bruce's car stereo, part of his massive MJ archive.

We eventually end up at the entrance to Zug Island, an industrial atoll in the middle of the Detroit River owned and operated by US Steel. There's a NO TRESPASSING sign on the bridge, but we cross it without trouble, arriving at an acrid-smelling stretch of land with dunes of coal and twisted metal intestines that stretch across a skyline of egg-white smoke. This is the place ICP calls home, even though Bruce and Utsler didn't grow up here.

They met as teenagers in the surrounding suburbs. Both had difficult upbringings, and their fathers left their family when they were young. "Every night was a fuckin' party," Utsler says of his childhood. "Drinkin, smokin' weed. It turned out to fuck me up in the long run." A recovering alcoholic and drug addict, he's been in and out of trouble ever since (he recently beat a rap for a concealed-weapons charge). Bruce's childhood was arguably worse. In Behind the Paint, he details how his father left with his family's money, forcing them to subsist on welfare. He and his siblings were then sexually abused by their first stepfather.

After becoming friends, Bruce and Utsler would come to Southwest Detroit to hang out, eventually moving here after dropping out of high school. Though they dreamed of becoming pro wrestlers, they soon took up rapping, using a boom box to record their earliest songs, which were heavily indebted to the slinking-bass sound of West Coast gangsta rappers like NWA. Eventually they hit on the idea of wearing clown makeup-inspired by nightmares Bruce used to have about being visited by a scary clown-which helped them stand out in Detroit's burgeoning rap scene. Few took them seriously. But Bruce and Utsler hustled day and night, putting up flyers throughout Detroit, living out of Kinko's, and hand-delivering their albums to every store they could. The duo worked with several major labels over the years, but those deals all derailed. So ICP gave up on the established record industry and soldiered on doing everything themselves. Along the way they discovered legions of outsiders and rejects who could relate to a struggling, downtrodden act that the establishment wouldn't accept.

"We represent those under the underdogs," Bruce says. "We represent scrubs." As proof, he motions for Utsler to lift up his shirt, revealing a large stomach tattoo that reads SCRUB LIFE, a spoof of Tupac Shakur's infamous thug-life credo.

ICP's do-it-yourself ethos is on display in Bruce's home studio as he and Utsler diligently work on a session with Axe Murder Boyz, two twentysomethings from Denver who are signed to one of Psychopathic's subsidiary labels. Bruce and Utsler develop their artists personally, often helping to pick names, determine a look, and occasionally cowrite songs. It can be a lengthy process: Perfecting the southern-goth scarecrow look

for Boondox, for example, took six months.

Figuring out how to promote Axe Murder Boyz hasn't been that easy. After at first
packaging them as bum-rushing thugs, Bruce
is now trying to mold AMB as a sort of Juggalo counterpart to Outkast, with one member dressed in a constantly changing array
of tight, colorful vintage shirts, while the
other wears more traditional gangsta garb.
For an hour, he urges them to just be themselves. Then he suggests they record an elaborate Jerry Springer parody. It's hard to tell
whether the Boyz are quietly mulling over the
idea or merely hoping Bruce is so high he'll
forget about the whole thing come morning.

In a few months, ICP will be back in the studio recording the next installment of the second Joker's Card deck. But before that, the pair plan on using the "Miracles" momentum to push a bunch of new projects. There's the possible VH1 show, though Bruce is wary of appearing on some Hogan Knows Best-style reality series ("There's a lot that's mysterious about us," he says. "If all of a sudden we were on some stupid reality show, fans would be like, 'Why have I got these assholes tattooed on my back?"") Then there's the wrestling school, which Bruce will use to host free matches. In many ways, it's the typical Insane Clown Posse endeavor: a counterintuitive, financially iffy brand enhancer that'll be mocked by critics, loved by fans, and built without any help from the outside. And the merch section will be huge.

"I know for a fact that we're nowhere near where we're going," Bruce says. We're sitting on the front porch of his house, listening to the midday cicadas. "You believe in *The Secret?*" he asks referring to the best-selling New Age self-help book. "We're firm believers in that shit, man. Something big's gonna happen. We're so sure of it that if my nuts were in a guillotine right now, I'd bet we haven't seen our best days."

A few minutes later, Utsler points up to one of the giant trees over Bruce's front patio. Way up high, easily 15 feet, a toddler's plastic car is wedged in the branches. It looks like it was displaced by a hurricane.

"How the fuck did that get up there?"
Utsler asks.

Bruce shrugs. Just another miracle. U

Contributing editor BRIAN RAFTERY (brianraftery@gmail.com) wrote about the Cheezburger Network in issue 18.02.

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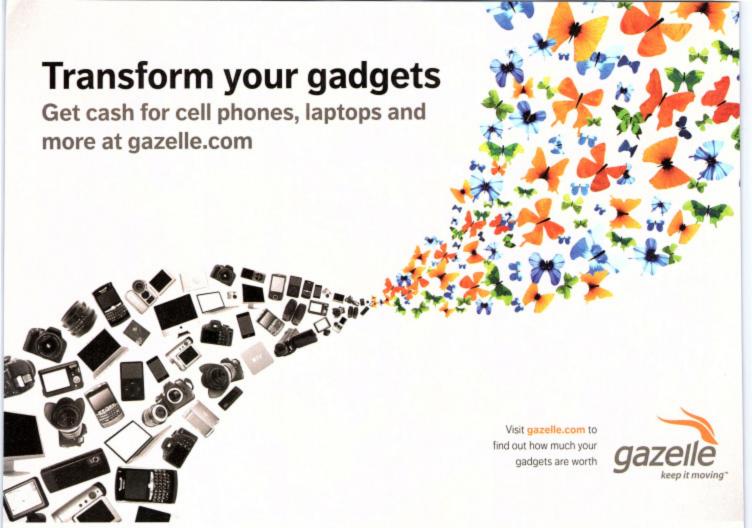
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#### Lists that helped get this issue out:

Advertising Age's Magazine A-List (WIRED's there); the AP Top 25 in college football: 109 cats in sweaters; "Lisztomania"; the Chicago Marathon race-day checklist; the breaks that helped the Giants advance in the playoffs; vetoed boys' names; Triumph, Orlando, Wyatt Rebel; the collection of Glee singles on Billboard's Hot 100; list in purse: justice, tampons; the wine list at Ventana Inn and Spa; 12 tablespoons melted butter, 1 cup brown sugar, 2 cup white sugar, 2 teaspoons vanilla, 1 egg, 1 egg yolk, 21/8 cups flour, 1/2 teaspoon baking soda, 1 teaspoon kosher salt, 8 ounces chopped bittersweet chocolate, 1/2 cup chopped walnuts (optional); Muni routes on Nextbus.com; listless 85-degree October days; GQ's Most Powerful Bald Men in America (followed by crushing disappointment that editor in chief Chris Anderson was not included); the topping options at Giorgio's Pizzeria; the guest register for an anniversary party that turned out to be a wedding; food consumed while editing Wish List: four Reese's peanut butter cups, approximately five Coca-Colas, an undetermined number of peppermint Altoids, two brownies, one Mongolian beef cheesesteak; listening to Franz Liszt; Ma, Pa, Penny, and Pickles.

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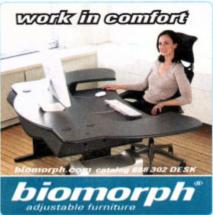


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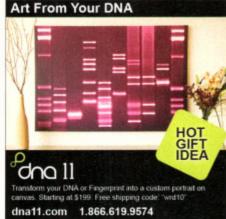
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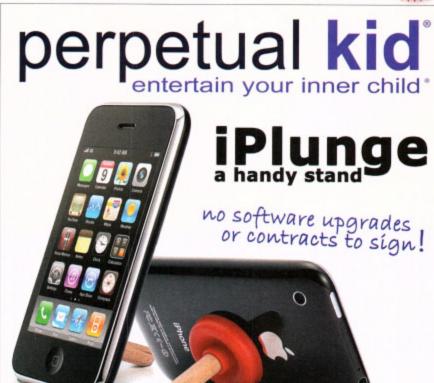


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